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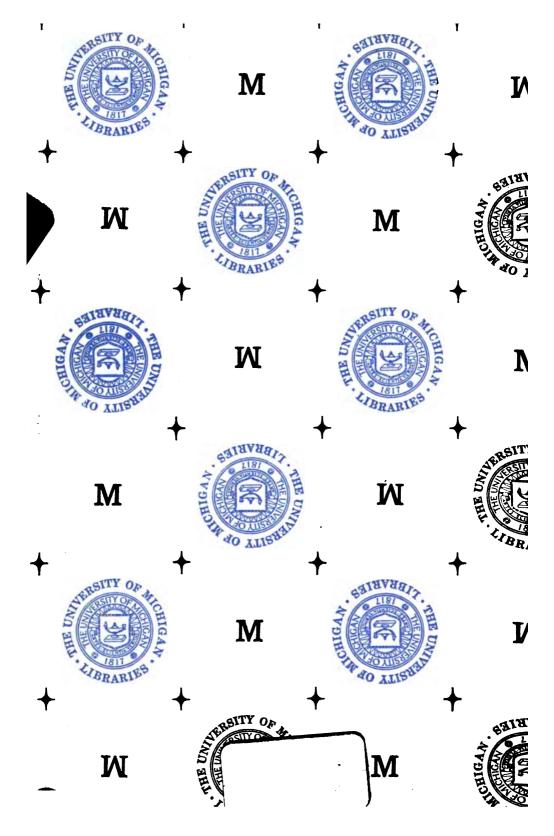
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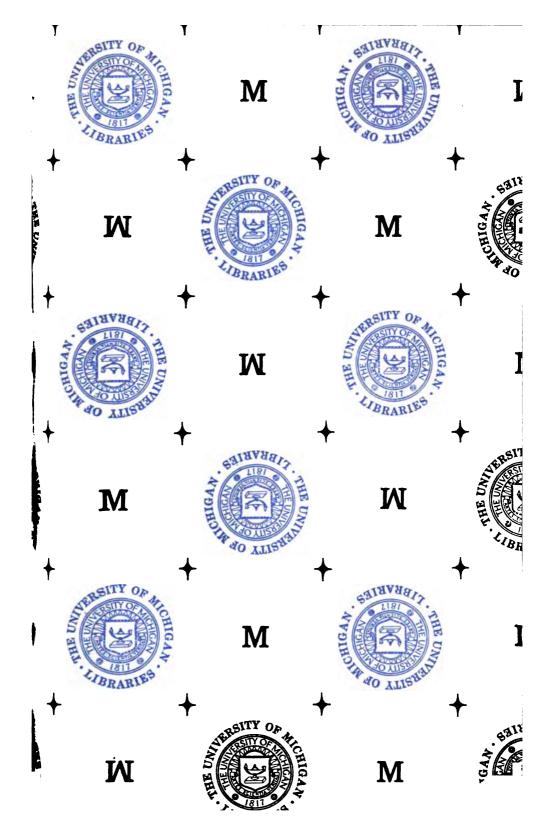
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PROCEEDINGS



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CONVENTION OF DRUGGISTS

ASSESSMENT OF THE PARTY.

First Annual Meeting

OF THE

MICHIGAN STATE

Pharmaceutical Association,

STREET, ST.

Lansing, Nov. 14 and 15, 1888.

25.00

CONSTITUTION AND BY-LAWS,

Rail of Members, etc.

ACRES JESSON, MOULT

THE R

CHARLES WRIGHT & CO.,

PHARMACEUTICAL CHEMISTS.

Main Office and Laboratory, Pacific Coast Branch,
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Sandalwood, etc., etc.
We manufacture or carry
in stock a full line of Fluid
and Solid Extracts, Elixire,
Gelatine and Sugar-Coated
Pills. (round or oviform),
Filled or Empty Capsules,
Specific Tinctures and Concentrations, on which we can
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uniform quality, and standard of goods guaranteed.
Prices quoted on application.

REFERENCES—Any Bank or Wholesale House in Detroit.

SYRUP OF TAR AND WILD CHERRY, WITH TOLU.

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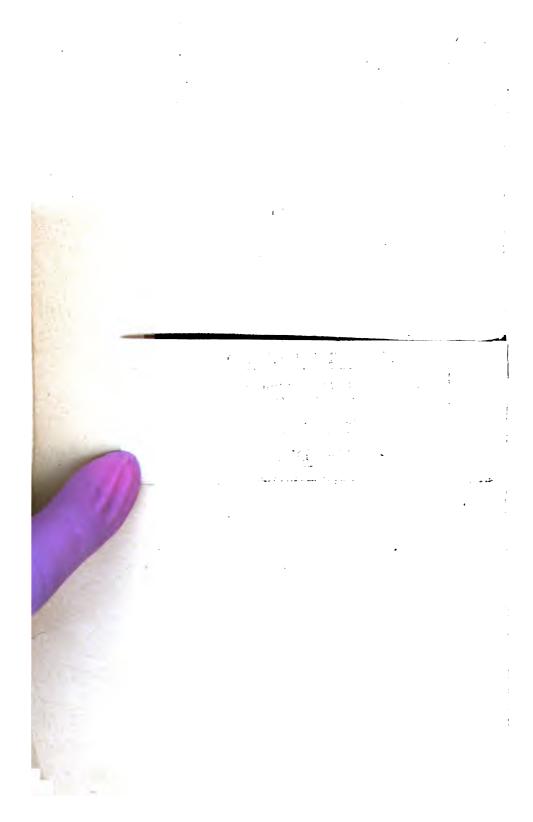
	1 gross.	6 doz.	3 doz.	1 doz.
Large or \$1.00 Size	\$45.00	\$2 5.00	\$14.00	\$5.00
Medium or 50c. Size	24 00	12.50	6.80	2.50
Small or 25 c. Size	16.00	8.25	4.85	1,50

Waco, Texas. You have made a happy hit on Syrup of Tar and Cherry. It is elegantly prepared and is
ahead of anything of the kind I have ever seen. The style of the package is certainly very
attractive.
S. B. Hamlett.

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CHARLES WRIGHT & CO., Manutacturing Pharmacists, DETROIT, MICH.

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PROCEEDINGS



€OF THE

CONVENTION OF DRUGGISTS

AND OF THE

First Annual Meeting

-OF THE-

MICHIGAN STATE

Pharmaceutical Association,

HELD AT

Lansing, Nov. 14 and 15, 1883.

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CONSTITUTION AND BY-LAWS,

Roll of Members, etc.

MUSKEGON, MICH.:

JACOB JESSON, Secretary,

1883





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Officers of the Association.

1883-4.

PRESIDENT.				
FRANK WELLSLansing.				
VICE-PRESIDENTS.				
ISAAC WATTS				
PERMANENT SECRETARY.				
JACOB JESSONMuskegon.				
Assistant secretary. "				
A. W. ALLEN				
TREASURER.				
Wm. Dupont				
EXECUTIVE COMMITTEE.				
G. W. CROUTER. Charlevoix. GEO. McDonald. Kalamazoo. F. M. Alsdorf. Lansing. O. P. Safford. Flint. H. J. Brown. Ann Arbor.				

Committees.

COMMITTEE ON TRADE INTERESTS. F. W. FINOHER. Pentwater. J. C. MUELLER. Detroit. GEO. McDonald. Kalamazoo. COMMITTEE ON PHARMACY AND QUERIES, A. B. PRESCOTT. Ann Arbor. A. B. STEVENS. Detroit. GEO. CUNDRUM. Ionia. COMMITTEE ON LEGISLATION. WM. B. WILSON. Muskegon. C. P. PARKILL. Owosso. H. J. Brown. Ann Arbor.

Delegates.

DELEGATES TO AMERICAN PHARMACEUTI-CAL ASSOCIATION.

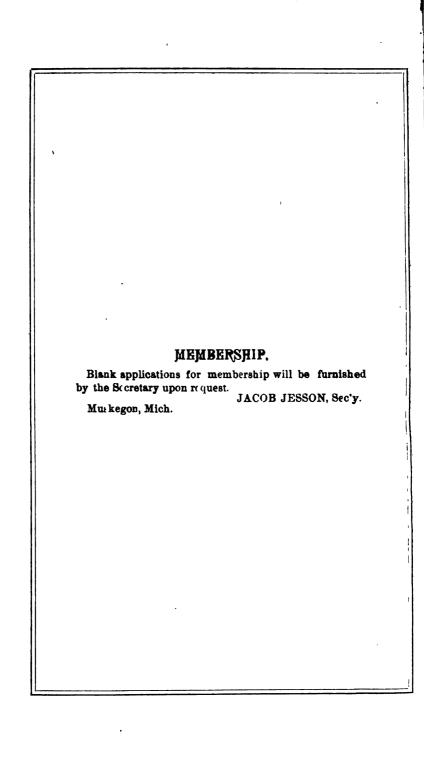
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A. B. Prescott	Ann Arbor.
GEO. GUNDRUM	Ionia.
C. P. PARKILL	Owosso.
A. S. PARKER	Detroit.
GEO. McDonald	Kalamezoo.
$m{A}$ lternates.	
F. W. FINCHER	Pentwater.
J. C. MURLLER	Detroit:
O. EBERBACH	Ann Arbor.
G. W. CROUTER	Charlevoix.
A. W. Banks	Detroit.

DELEGATES TO NATIONAL RETAIL DRUGGISTS, ASSOCIATION.

FLETCHER SMITH	Saginaw.
F. W. R. PERRY	Detroit.
H. J. Brown	Ann Arbor.
J. Q. Look	Lowell.
C. A. PINKNEY	Plymouth.

Alternates.

Frank Inglis	Detroit
JOHN G. WOLF	· · · · · · · · · · · · · · · · · · ·
O. P. Safford	
W. A. SEVERSON	
L. T. WHITE	



PREFACE.

This report would be incomplete without a brief statement of the beginning of the work that led to the formation of the Michigan Pharmaceutical Association. A notice appeared in The Druggist of Chicago, advocating the movement, and stating that a number of leading druggists in Michigan favored the formation of a State Pharmaceutical Association, which led to considerable correspondence, as a result of which the following circular was mailed Oct. 1, 1883, by Jacob Jesson, of Muskegon, to every known drug firm in the State:

DRUGGISTS OF MICHIGAN!

SHALL A STATE PHARMACEUTICAL ASSOCIATION BE ORGANIZED?

Every Western State of importance, with the single exception of Michigan, now has a Pharmaceutical Association. These Associations are all prosperous, indicating that the druggists of these States derive substantial benefits from organization.

There is unquestionably a wide spread and earnest sentiment in Michigan in favor of a State Association. It would seem the time has come to give this sentiment expression in active work. There are many reasons why a Michigan Pharmaceut cal Association should be organized.

A State Pharmacy law is needed for the protection and elevation of the profession of pharmacy in the public interests; experience in other States proves that a go d law is impossible without an Association to shape its provisions and give force to legislation.

An A sociation is needed to enable Michigan to co-operate in the cause of scientific progress, and the work of trade advancement. Michigan should make itself heard through delegates at the American Pharmaceutical Association, and the National Retail Drug Association. Upon the important questions of the day, Michigan, of all the

great States of the Union, is silent and unknown. This is a discredit to the State and an unworthy reflection upon the enterprise and intelligence of Michigan druggists.

It is proposed that the Association combine, in just proportion, the scientific and business interests of the druggists of the State; that it be an association of business men as well as of scientific men; that it be representative of every section of the State, city, village and country. That every question, of whats ever nature, of importance to Michigan druggists, be open to discussion and adjustment.

Upon the broad platform of professional and trade advancement, the Association must succeed. Let the campaign be inaugurated at once; assurance of co-operation and support have already been received sufficient to guarantee success; but we want not only success, but a grand success worthy of the thousand druggists in the State. Your personal influence and co-operation is earnestly solicited.

It is proposed to call the meeting to convene in some central city at an early day. The announcement should bear the name of every druggist in Michigan; let all join in the call and thus give assurances that the movement is of the druggists, by the druggists, and for the druggists of the ENTIRE STATE.

A blank for signature is inclosed, which it is hoped you will sign (indicating also your preference for time and place of meeting), and return by first mail.

Very truly, JACOB JESSON

October 1, 1883. Muskegon, Mich.
The following, among others, join in the preliminary call:

A. H. Lyman, Manistee.
John W. Dunlop, Clare.
W. Johnston & Co., Detroit.
A. B. Pr. scott, Ann Arbor.
Larimore & Dean, Niles.

Address all communications relating to this circular to Jacob Jesson, Muskegon, Mich.

In reply to the foregoing, nearly 300 druggists in the State signified their approval of the formation of the Association and authorized their names to be added to the formal announcement. In view of this generous response, Mr. Jesson felt justified in issuing the announcement, as follows:

M. P. A.

BHALL A MICHIGAN PHARMACEUTICAL ASSOCIATION BE ORGANIZED? THE QUESTION ANSWERED IN THE APPLEMATIVE BY NEARLY 300 DRUGGISTS.

ANNOUNCEMENT.

On Oct 1 a circular was addressed to the druggists of

Michigan, setting forth the need of a State Pharmaceutical Association, the objects to be attained through organization, and inviting signatures for the formal call.

The response was so general, so enthusiastic, that no doubt remained as to the sentiment of the State on the subject. We therefore, announce that a Convention of the druggists of Michigan for the said purpose, will be held at Lansing, commencing Wednesday, Nov. 14, 1883, at 2 o'clock P. M., in the Chamber of the House of Representatives. The headquarters will be at the Lansing House, where it is desired all will report promptly on arrival, and register on the Convention Roll.

Reduced rates at the hotels have been secured, as fol

A rate of one and one-third fare on the following roads has been secured: Detroit, Grand Haven & Milwaukee; Michigan Central; Chicago & Grand Trunk; Detroit, Lansing & Northern; Lake Shore & Michigan Southern.

To obtain reduced rate, it is in all cases necessary to send request for certificate to Jacob Jesson, Muskegon, at once

on receipt of this announcement.

A large attendance is anticipated. With a view of learning the sentiment of Michigan druggists with regard to a pharmacy law, the draft of an act will be offered for discussion.

The unanimity of interest manifested by our druggists in this movement has probably few parallels in the history of similar enterprises in America. To the truth of this statement let the array of indorsements below presented bear witness. Your personal co-operation is desired. Interest your neighbors in this announcement; let all attend and the occasion thus be made a pronounced success professionally, commercially and socially.

Druggists desiring to join the Association but who may be unable to attend, may become members upon making

application as per blank form attached.

Make P. O. order or draft payable at Lansing to the Treasurer of the Michigan Pharmaceutical Association, which send with this application to me at Muskegon, Mich., until Saturday, Nov. 10, 1883, after that date until the 14th, to my address, care of the Lansing House, Lansing, Mich.

The fees will in all probability not exceed \$3.00. Should they be less as determined by the by-laws when adopted, the difference will be remitted.

Very truly,

November 1, 1883.

Jacob Jesson, Muskegon, Mich.

PREFACE.

The attendance on the Convention at Lansing, Nov. 14 and 15, 1883, was larger in proportion to the total number in the State, than we have seen at the initial meeting of any other State Association. The observation of an inquisitive son of Africa at the Lansing House, upon being told, in answer to an inquiry as to what delegation of Michigan s'atesmen had assembled in the ca; itol, that it was a convention of druggists, was not an empty compliment. "I thought," said he, 'it could not be the legislature they are too well dressed and respectable-looking." It was to have been expected that the representatives of pharmacy in Michigan would be fully up to the average of other Western States in point of intelligence and progressive spirit, in view of the relatively larger number of cities, the longer period of development consequent upon the seniority of the State and of the flourishing school of pharmacy established by the legislature, and so ably sustained by the vigorous and enterprising management. The personnel of the Convention was evidently representative in character, and demonstrated a wide-spread interest in the aims and objects of the association as briefly formulated in the preamble to the constitution and by-laws adopted.



PROCEEDINGS

OF THE

CONVENTION OF MICHIGAN DRUGGISTS,

AND

FIRST ANNUAL MEETING

OF THE

Michigan Pharmaceutical Association

HELD IN THE

Chamber of the House of Representatives at Lansing, Nov. 14 and 15, 1883.

The meeting was ca'led to order at 2 o'clock on the afternoon of Wednesday, Nov. 14, by Mr. Jacob Jesson, of Muskegon, who pl-ced in nomination for chairman of the preliminary organization, George Gundrum, of Ionia. The nomination was duly confirmed, and Mr. Gundrum briefly expressed his thanks for the compliment of his election and called upon Mr. Jesson to state the objects of the meeting.

Mr. Jesson expressed his pleasure at being present and witnessing so representative an attendance; the profession of pharmacy is entitled to recognition as a profess on, instead of being regarded by the public as chiefly a trade in patent medicines and by the law as a business for the vending of intoxicating liquors. All present were evidently there on the same mission, that of contributing to the elevation of the profession, and advancing the legitimate interests of the drug trade. When

the druggists of the State had been asked if a State Association should be organized, and over two hundred and fifty responded in the affirmative, he felt justified in calling the meeting. "Lat us organize an association which shall be a credit to all its members and to the State, and which shall be representative of our scientific as well as our trade interests." [Applause.]

Mr. Jesson was then upon motion chosen Secretary pro

It was moved that in order to know who is present, the Secretary be requested to read from the convention register signed at the hotel and those present not on the list to give their names. Adopted.

The Secretary read the list, and found the following druggists in attendance:

Jacob Jesson, Muskegon, Wm. B. Wilson, Muskegon, A. B. Stevens, Detroit, S. E. Parkill, Owosso, I. L H. Dodd, Buchanan, W. A. Severson, Buchanan, Frank Inglis, Detroit, W. D. Lumbard, Jackson, O. J. Price, Detroit, C F. Covert, Paw Paw, F. S. Mellington, Paw Paw, F. H. Hendrick, Edmore, F. P. Merrell, Hartford, G.T. Chamberlin, Hartford, C. E. Humphrey, Jackson, Burr D. Northrup, Lansing, O. P. Safford, Fiint, W. K. Walker, Utica, C. A. Pinckney, Plymouth, A. O. Hyde, Marshall, F. E. Judson, Brighton, _ A. B. Prescott, Ann Arbor, F. Smith, Saginaw, Cyrus C. Tubbs, Chesaning, Charles Wright, Detroit, C. W. Hamilton, St. Charles, John J. Dodds, Detroit, A. S. Wallace, St. Johns, F. M. Douglas, Bancroft, Chas. M. Smith, Clarkston,

Manley Bower, Clarkston,

John G. Wolf, Hillsdale,

H. W. Calkins, Detroit. Wm. Dupon, Detroit. A. W. Allen, Detroit, F. W. R. Perry, Detroit, J. J. Goodyear, Ann Arbor, Geo. L. Davis, Lansing, Jas. Hullinger, Mecosts, L. C. Goodrich, Kalkaska. E. W. Ross, Detroit, E. A. Bullard, Vassar, E. F. Phillips, Armada, J. Q. Look, Lowell, A. W. Banks, Detroit, . H. J. Brown, Ann Arbor, Frank Wells, Lansing, A L. Bours, Detroit, N. F. Carmon, Lansing, G. D. Millspaugh, Marshall, F. M. Alsdorf, Lansing,

L. E. Hewett, Lansing,

Geo. Gundrum, Ionia, L. T. White, Eaton Rapids, J. F. A. Raider, Newaygo, C. P. Parkill, Owosso, Isaac Watts, Grand Rapids, W. H. Hicks, Morley, H. D. Harvey, Bangor, G. W. Crouter, Charlevoix, F. N. Latimer, Ludington, Geo. A. Dietz, Cadillac, Jas. L. Spenser, Linden, F. W. Fincher, Pentwater, M. C. Merrill, Bancroft, J. C. Mueller, Detroit,

I. V. Brown, Galesburg, E. L. Jones, Battle Creek, G. W. Forrest, Chase, A. S. Parker, Detroit, Geo- McDonald, Kalamazoo, O. Eberbach, Ann Arbor, Carl Riebe, Ann Arbor, A. R. Champney, Detroit, J. L. Francis, Ypsilanti, W. L. Robson, Williamstown, W. A. Tuttle, Williamstown,

Frank Wells (Lansing) moved the appointment of a committee of three to report on a form of permanent or-Seconded by J. G. Wolf (Hillsdale) and ganization. adopted.

On motion of Mr. Parkill (Owosso) Mr. Wells was made Chairman of the Committee. On motion Messrs. W. B. Wilson (Muskegon) and Mr. Dodds (Detroit) were constituted the balance of the Committee.

Mr. Wells (Lansing) moved that the number of the Committee be increased to five, which on motion of Mr. Dodd (Buchanan) was laid upon the table.

It was then moved that Prof. Prescott (Ann Arbor) and Mr. Jesson (Muskegon) be added to the Committee, which was carried, and an intermission of ten minutes taken to report.

Upon re-assembling, the Committee reported the following order of business for the day: (1) Discussion on phar macy bill; (2) reading and discussion of papers; (3) session for miscellaneous business in the evening; (4) informal reception at the Lansing House immediately after adjournment. The report also recommended that, pending the formation of a permanent organization, Mr. Wilson act as temporary president, and Mr. Jesson as Secretary.

Mr. Wells, chairman of the Committee, added that when they came to consider the question, they concluded it was not their duty to report a Constitution and By-Laws. The appointment of a special Committee for this office, they thought, properly devolved upon the Chairman.

The report was adopted.

Mr. Wilson, in taking the chair, said:

Gentlemen of the Convention: I desire to thank you for the honor conferred in electing me to preside over the organization of the first Pharmaceutical Convention of Michigan. I am very much gratified in seeing so large an attendance, and the deep interest taken in the organization of a State Pharmaceutical Association, will, I trust, make it a grand success—and that the results will be not only beneficial to the retail druggists, but will eleva'e and advance the standard of Pharmacy in Michigan. Again thanking you gentlemen, for the high honor conferred, I now ask what is the pleasure of the convention?

Mr. Wells (Lansing) moved the appointment of a Committee on Constitution and By-Laws

Mr. Parkill (O wosso) said the motion was unnecessary sinc; it was comprised in the adoption of the report of the Committee on Organization.

The Chairman stated that while this was true, he would prefer not to go through the various orders embraced in the report without special motion.

Mr. I-aac Watts (Grand Ripids) inquired if the officers elected from the report of the Committee were intended to be the permanent officers of the Association.

The Cuairman replied that they were the officers only of the Convention. The officers of the Association could be elected only after the adoption of a Constitution and By-Laws.

The chair then announced the following appointments on the Committee of Constitution and By-Laws: Frank Wells, Lansing; F. W. Fincher, Pentwater; I L H. Dodd, Buchanan; Frank Inglis, Dutroit; Isaac Watts, Grand Rapids.

The next business in order being a discussion upon pharmaceutical legislation for the State, Secretary Jesson was requested to read a draft previously prepared for submission to the Convention. The draft as read is as follows:

MICHIGAN PHARMACY BILL.

SECTION 1. Be it enacted, etc.—That it shall not be lawful for any person to open or conduct any pharmacy, drug store, or place for retailing, compounding, or dispensing drugs, medicines, or poisons for medical use unless such person shall be registered under the provisions of this act, or shall employ or place in charge of such pharmacy or

store a registered pharmacist within the meaning of this

act, except as hereinafter provided.

SEC. 2. Every person who shall within three months after this act shall take effect, forward to the Board of Pharmacy, hereinafter mentioned, satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, and in the vending and compounding of drugs, medicines, and poisons, shall, upon the payment of the fee, hereafter mentioned, be granted a certificate of registration: Provided, That in case of failure or neglect to register as herein provided, then such person shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy, hereinafter described.

pharmacy, hereinafter described.
SEC. 3. Licentiates in pharmacy shall be entitled to registration, and must be such persons as have had two years' practical experience in drug stores where the prescriptions of medical practitioners are compounded, and have passed a satisfactory examination before the State Board of Pharmacy, hereinafter mentioned. The said board may grant certificates of registration, without further examination, to the licentiates of such other boards of pharmacy as

it may deem proper.

SEC. 4. Any assistant or clerk in pharmacy who shall not have the qualification of a registered pharmacist, within the meaning of this act, not less than eighteen years of age, who, at the time this act takes effect, shall be engaged in such service and have been employed or engaged two years or more in drug stores where the prescriptions of medical practitioners are compounded, and shall furnish satisfactory evidence to that effect to the State Board of Pharmacy, shall, upon making application for registration, and upon the payment to the secretary of the said board of a fee of one dollar, within sixty days after this act takes effect, be entitled to a certificate as a "registered assistant," which said certificate shall entitle him to continue in such duties as clerk or assistant; but such certificate shall not entitle him to engage in business on his own account unless he shall have had at least five years' experience in pharmacy at the time of the passage of this act. Annually, thereafter, during the time he shall continue in such duties, he shall pay to the said secretary a sum not exceeding fifty cents, for which he shall receive a renewal of his certificate.

SEC. 5. The Governor, with the advice and consent of the Senate, shall appoint five persons from among such competent pharmacists in the State as have had ten years' practical experience in the dispensing of physicians' prescriptions, who shall constitute the Board of Pharmacy. The persons so appointed shall hold their offices for five years: Provided, The term of office of the five first appointed shall be so a ranged that the term of one shall expire on the thirtieth day of December of each year; and the vacancies so created, as well as all vacancies otherwise occurring, shall be filled by the Governor, with the advice and consent of the Senate: And provided also, That appointmen's made when the Senate is n t in in session, may be confirmed at its next ensuing session. The Michigan Pharmaceutical Association shall annually report directly to the Governor, recommending, the first year, the names of at least ten persons, whom said association shall deem best qualified to serve as members of the Board of Pharmacy, and the names of at least three persons each year thereafter, to fill any vacancies which shall occur in said board.

SEC. 6. The said board shall, within thirty days after its appointment, meet and organize by the election of a president and secretary from its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the board. It shall be the duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to cause the prosecution of all persons violating its provisions; to report annually to the Governor and to the Michigan Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all pharmacists duly registered under this act; the board shall hold meetings for the examination of applicants for registration, and the transaction for such other business as shall pertain to its duties, at least once in three months; it shall give thirty days' public notice of the time and place of such meetings; shall have power to make by-laws for the proper fulfillment of its duties under this act, and shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. Three members of said board shall constitute a quorum.

SEC. 7. Every person applying for registration as a registered pharmacist, under Section 2 of this act, shall, before a certificate is granted, pay to the secretary of the board the sum of two dollars, and a like sum shall be paid to said secretary by licentiates of other boards, who shall apply for registration; and by every applicant for registration by examination shall be paid the sum of five dollars: Provided, That in case of the failure of any applicant to pass a satisfactory examination, his money shall be

refunded.

SEC. 8. Every registered pharmacist who desires to contine the practice of his profession, shall annually, thereafter, during the time he shall continue in such practice, on such date as the Board of Pharmacy may determine, pay to the secretary of the said board a registration fee, to be fixed by the board, but which shall in no case exceed two dollars, for which he shall receive a renewal of said registration. Every certificate of registration granted under this act shall be conspicuouly exposed in the pharmacy to which it applies.

SEC. 9. The secretary of the board shall receive a salary which shall be fixed by the board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of the board shall receive the sum of five dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in attending the meetings of said board. Said expenses shall be paid from the fees and penalties received by the board under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be held by the secretary as a special fund for meeting the expenses of said board; he giving such bonds as the board shall from time to time direct. The board shall, in its annual report to the Governor, and to the Michigan Pharmaceutical Association, render an account of all moneys received and disbursed by them, pursuant to this act.

SEC. 10. Any person not being or having in his employ a registered pharmacist, within the meaning of this act, who shall, sixty days after this act takes effect, keep a pharmacy, or store, for retailing or compounding medicines, or who shall display or exhibit his name upon the sign, card, or label of such store or pharmacy, shall be deemed guilty of a misdemeanor, and for every such offence shall be liable to a penalty of fifty dollars. registered pharmacist who shall permit the compounding and dispensing of prescriptions, or the vending of drugs, medicines or poison in his store, or place of business, except under the supervision of a registered pharmacist, or except by a "registered assistant" pharmacist, or any pharmacist or "registered assistant," who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall willfully make any false representation to procure registration for himself or any other person, or shall violate any other provision of this act, shall for every such offence, be liable to a penalty of dfty dollars: Provided, That nothing in this act shall apply to, or in any manner interfere with the business of any physician, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the making or

vending of patent or proprietary medicines, or medicines placed in sealed packages, with the name of the contents and of the pharmacist or physician by whom prepared or compounded, nor with the sale of the usual domestic remedies by retail dealers, nor with the exclusively wholesale business of any dealers, except as hereinafter provided.

SEC. 11. No person shall add to or remove from any drug, medicine, chemical, pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value, or medical effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus willfully adulterate or alter, or cause to be adulterated or altered, or shall offer for sale any such adulterated or altered drug, medicine, chemical, or pharmaceutical preparation, or any person who shall substitute or cause to be substituted one material for another with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. If convicted he shall be liable to all the costs of the action, and all expenses incurred by the Board of Pharmacy in connection therewith, and for the first offence be liable to a fine of not less than fifty dollars, nor more than one hundred dollars, and for each subsequent offense a fine of not less than seventy-five dollars, nor more than one hundred and fifty dollars. On complaint being entered, the Board of Pharmacy is hereby empowered to employ an analyst or chemist expert, whose duty it shall be to examine into the so-claimed adulteration, substitution, or alteration, and report upon the result of his investigation; and if said report justify such action, the board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 12. No persons shall sell at retail any poisons commonly recognized as such, and especially aconite, arsenic, belladonna, biniodide of mercury, carbolic acid, chloral hydrate, chloroform, conium, corrosive sublimate, creosote, croton oil, cyanide of potassium, digitalis, hydrocyanic acid, laudanum, morphine, nux vomica, oil of bitter almonds, opium, oxalic acid, strychnine, sugar of lead, sulphate of zinc, white precipitate, red precipitate, without affixing to the box, bottle, vessel, or package containing the same, and to the wrapper or cover thereof, a label bearing the name of the article, and the word "poison" distinctly shown, with the name and place of business of the seller, who shall not deliver any of said poisons to any person under the age of fifteen years, nor shall he deliver any of said poisons to any person without satisfying himself that such poison is to be used for a legitimate purpose: Pro-

vided, That nothing herein contained shall apply to the dispensing of physicians' prescriptions of any of the poisons or articles aforesaid. Any person failing to comply with the requirements of this section shall be liable to a penalty of five dollars for each and every such offense.

SEC. 13. All suits for the recovery of the several penalties prescribed in this act, shall be prosecuted in the name of the "People of the State of Michigan," in any court having jurisdiction; and it shall be the duty of the prosecuting attorney of the county where such offense is committed to prosecute all persons violating ihe provisions of this act, upon proper complaint being made. All penalties collected under the provisions of this act shall inure, one-half to the Board of Pharmacy, and the remainder to the school fund of the county in which the suit was prosecuted, and judgment obtained.

At the conclusion of the reading Dr. G. W. Crouter (Charlevoix) moved that Mr. Engelhard, of *The Druggist*, Chicago, be invited to address the association on the subject of the proposed law, and that Dr. H. Le Caron, of Braidwood, Ill., President of the Illinois Pharmaceutical Association, who had honored them with his presence, be also invited to address the meeting.

Mr. Engelhard said the draft of the pharmacy bill submitted embodied in his judgment, the best provisions for an efficient and popular pharmacy law which experience in other States was able to suggest. The important clause in Section 1, which had been open to criticism in New York and elsewhere, was that which permitted not only a registered pharmacist to open or conduct a drug store, but which permitted any person to invest his money in and to own a pharmacy, provided he placed in charge of the pharmacy a registered pharmacist. The speaker said that the legislature of Michigan would assuredly not pass a law in the special interest of any class or profession of men. The sole argument for a pharmacy law must be the protection of the public from the dangers attending the dispensing of medicines by uneducated and incompetent men. Clearly the public is not interested in who is the proprietor of the pharmacy so long as it is under competent management and in skilled hands. Let any man own the store, but insist simply that it shall be in charge of a registered pharmacist as provided in the draft submitted. Section 2, the speaker continued, provides that every druggist in business

when the law goes into effect shall be allowed to continue in business upon simply making application for registra-This he believed essential to the popularity and success of any bill on the subject. To attempt legislation contemplating an examination from every druggist already in business would be to array in opposition to it ninetenths of the druggists of the State. Moreover, a law which should practically threaten the validity of a man's title in a business established before the law went into effect, would be liable to constitutional objections of an ex post facto nature. As a matter of expediency therefore as well as of justice and legal right, the law should admit all in business at the date of its taking effect, and simply require that all entering thereafter shall first demonstrate their competency. From a reading of Section 3, it would be seen that no specific provision is made for registering graduates in pharmacy or graduates in medicine, but all entering after the law becomes operative shall qualify by examination before the State Board. To the honor of the management of the Michigan School of Pharmacy, be it said, it is the first among schools of pharmacy in America or the world to indorse such provision. leges of pharmacy heretofore have insisted upon the right of their diplomas to recognition in lieu of an examination, and it was gratifying indeed to see the Ann Arbor school in the van on this advanced legislative ground. The Philadelphia College struck the last Pennsylvania bill a fatal blow by insisting upon the graduate-in-pharmacy clause, and a similar clause in the Illinois law had compelled the admission also of graduates in medicine. latter will always be found asserting equal rights in pharmacy laws with graduates in pharmacy, and their superiority in numbers and influence places them in a position where they can too often enforce their demands. A further objection to the graduate in pharmacy principle is that it inevitably leads to admitting all classes of graduates, and a competition is thus introduced between the schools as to which can turn out graduates in the quickest time-with the result that cheap schools are nourished and multiplied, as is now clearly apparent in the case of many American medical colleges.

speaker further referred to the clause recognizing the influence of the State Association in Board appointments as desirable, and the feature of an annual registration fee as indispensable unless it was deemed best to risk the chances of the bill upon the possibility of securing a State appropriation to support the law. He had no doubt that, with a popular, liberal bill such as that proposed, a Michigan pharmacy law could, with a strong association and a determined general sentiment behind it, be made a fact by the next legislature. [Applause.]

Dr. Le Caron was then invited to speak, and responded as follows:

ME. CHAIRMAN AND BROTHERS: Allow me on behalf of the Illinois Pharmaceutical Association to tender you a cordial greeting. If what I see before me is not more than a fair index of your spirit, I have no fear of the result. In my judgment the druggists of Illin is have much cause to congratulate themselves over the success of their State Association, and the success of the State Pharmacy law. Four years ago Illinois was without a State Association; its forces in pharmacy were disorganized and without form. Now, its association represents a membership of over 700—constituting, I believe, the largest in the Union. I am much gratified to see that the druggists of Michigan are fully alive to questions of education and progress, and I wish them God-speed. [Applause.]

The Secretary then read the following dispatches:

SOUTH BEND, IND., Nov. 14, 1883.—To the Michigan Pharmaceutical Convention:—Indiana sends greetings to the pharmacists of Michigan. May success be with you. Fraternally, Leo. Eliel.

JANESVILLE, Wis., Nov. 14, 1883.—To the Michigan Pharmaceutical Association:—Wisconsin Pharmaceutical Association tenders congratulations and best wishes for the success of your Association.

EDWIN SUMNER, President. E. B. HEIMSTREET, Secretary.

DAVENPORT, IA., Nov. 14, 1893.—I congratulate the druggists of Michigan upon the promises of a successful meeting.

G. H. Harrison,

President Iowa Asso'n.

A communication from J. W. Colcord, Secretary of the National Retail Druggists' Association, was also read, predicting that the pharmacists of Michigan would never

regret the step. He hoped that while devoting its due attention to the science of pharmacy, the Association would not forget questions of trade, nor their representative national trade organization, the N. R. D. A.

Each dispatch as it was read was received with applause and on motion the Chairman was requested to transmit suitable replies which was duly attended to by forwarding the following dispatches, signed by the President and Secretary:

Lansing, Mich, Nov. 14, 1883.

Leo. Eliel, South Bend, Indiana:—The Michigan State
Pharmaceutical Association heartily reciprocates your
kind words of greeting. (Signed).

To Messrs. Edwin Sumner, President, Madison, and E. B. Heimstreet, Secretary, Janesville, Wis.:—The Michigan State Pharmaceutical Association returns greetings to Wisconsin. (Signed).

To J. H. Harrison, President, Davenport, Iowa:—Accept hearty reciprocation of your greetings for Michigan Pharmacists. All success to Iowa Association and its work.

(Signed).

To J. W. Colcord, Secretary Massachusetts Pharmaceutical Association: The Pharmacists of Michigan, in convention to-day, thank you for your kind words of greeting. Wm. B. Wilson, President of Convention; Jacob Jesson, Storetary.

Prof. Prescott was requested to state his views relative to pharmaceutical legislation in the State. He said he was much interested in the reading of the draft. The fact that many States have pharmacy laws requiring pharmacists to register shows that such laws commend themselves to intelligent minds. In his judgment the public is prepared to recognize the propriety of such legislation if the question can be properly brought before the people. Though it is yet some time before the question can be reached in Michigan, it is none too-early to begin. thought the draft should be discussed section by section at the session, and what is said and done published to the profession and the public. It is well that everything to be done be first thoroughly matured. The precursor of a wise law is necessarily a State Association. The organizations in States bounding Michigan have all moved for a

law, and three, Illinois, Iowa and Wisconsin, have laws in successful operation. The speaker stated he had little to say with regard to what the law should be. Some points, however, had been mentioned, on which he desired to say a word. It was futile to legislate for the past, and it should be remembered that the present is but a part of the past. All engaged in business when the law goes into effect, and all employed as clerks, belong to the present, and should therefore be regarded as entitled to the same exemptions in law as though they formed a part of past conditions and What ever is done should be done for the future, and the law may therefore justly require that all desiring to enter the business after its passage shall be competent. In the beginning all clerks who have been employed in the business long enough to merit the name should be admitted without examination. Assistants who have been long in business, say five, ten or fifteen years, would in any event doubtless be able to pass. Men in business at the time the law passed should be granted a certificate. legislate otherwise would be a blockade upon success. Men having their capital invested in business dislike to be compelled to submit to a test which would be regarded by the public as a reflection upon their qualifications, and thus injure their business. They might justly urge that they entered into business under existing regulations, and have a legal right to continue. But, from those who thereafter desire to enter the business to practice pharmacy qualifications should be required—an examination by a Board nominated by practical pharmacists and composed of men representing the various professional and business interests involved. The speaker had been convinced for many years that it was unwise to have graduates in pharmacy exempted from examination. Just so soon as strong laws are passed in many States, so soon will there be a proportionately strong incentive to get in on slight qualifications. Graduation in this country does not mean much now, but if the tendency continues as at present, it will soon mean less. The feature in the draft under consideration making no special exemptions in favor of graduates should be strongly urged. Then, again, the admission of graduates in pharmacy would raise the question of the re-

lations of graduates in medicine. They all knew that pharmacy is a profession by itself. The physician, by virtue of his office, is no more a pharmacist than a phar-It is well known that if graduates macist is a physician. in pharmacy claim admission, graduates in medicine will demand admission also. The Ann Arbor school said to its graduates, "We hope when you go out you will be required to pass an examination;" if they succeed, all the better. The speaker had never heard any disinclination expressed on the part of the Ann Arbor graduates to pass an exam-They are willing to stand the test, just as it is said eels are willing to be skinned alive. [Laughter.] One other point—the question of an annual fee. "I should be glad if we could secure an appropriation from the legislature. But after the first registration fee-all would be willing to pay that—the Board must continue to have a revenue wherewith to pay their expenses and some remuneration for their work. If the druggists of the State cannot get an appropriation, then the best thing to do is to faise the amount themselves by annual registration fees." [Applause.]

It was moved that, inasmuch as the convention desired to be able to discuss the draft intelligently, a copy of it be ordered printed for use at a subsequent session.

Mr. A. O. Hyde (Marshall) asked if the gentlemen present from other States would inform them as to how the laws there are being enforced.

Mr. Le Caron, replying for Illinois, said the law in the State was, to the best of his knowledge, being vigorously enforced.

Mr. Hyde stated that in conversation with a certain druggist of Dixon (Itl.) he was told that four out of five druggists in that city were not members of the State Association and did not observe the law.

Mr. Engelhard explained that the statement may have been due to the impression prevalent in some sections of the State that membership in the State Association formed a part of the requirements of the pharmacy law—an entirely erroneous idea.

Messrs. Alsdorf (Lansing) and G. L. Davis (Lansing)

were appointed a committee to get the pharmacy bill printed.

Mr. Brown (Ann Arbor) said that when he resided in Rhode Island three or four years since, a pharmacy law was in operation and pretty well enforced. One in his town was not registered. In order to prosecute, it was necessary for somebody to enter complaint. The druggists in business in the same town, though sensitive of the injustice, felt delicate about preferring charges, especially as the man was poor. In framing a law, it should, if possible, be made the duty of the Board to enter complaint and prosecute, and thus relieve the local druggists from such duty.

At this juncture the report of the Committee on Constitution and By Laws was called for. Mr. Wells, Chairman of the Committee, said the Committee would require more time. They would report in the evening, if possible.

Mr. Dodd (Buchanan) remarked that they were most interested in this report. They would have another opportunity to discuss the pharmacy bill next year before the legislature meets. They could study it at home, where it could be more carefully and intelligently considered. He moved that the motion relative to printing of the bill be rescinded.

This action was found to be inexpedient for reason that the Committee had already retired to order the bill printed.

Mr. Davis (Lansing) did not see why the bill should not be discussed at the afternoon session of the following day.

Mr. Brown (Ann Arbor) raised the question, if the discussion should in any event take place before the permanent organization was effected. Otherwise any action taken would necessarily be unofficial.

Mr. Gundrum (Ionia) said the bill appeared quite clear, and that he believed it would be endorsed by the druggists of the State. The State was well represented at the meeting. Though he was the only druggist present from his town, all were favorably disposed toward the Association and its work.

The Secretary at this point read a communication from Prof. Bedford, of New York, counseling that should a Pharmacy Law come up for consideration, let it be brief, simple, and if any examinations are required, do not insist on letting graduates in Pharmacy be registered without examination. This appears to excite opposition by all who are not graduates; neither exempt physicians. Require all not in business when the bill becomes a law to be examined.

Mr. Northrup (Lansing) suggested that an interesting order for the afternoon would be the discussion of the advantages of membership in the Association. If druggists not present at this time were asked to join, the first question would be, "What advantages do you offer?" As a member of the previous State organization he took pleasure in the attendance he witnessed. He saw more than three times as many present at this meeting as at any session of the former Association. [Applause].

Prof. Prescott said all that ailed the former society was it was small and it never grew. [Amusement]. They never had as many members in Detroit when the meeting was held there as were now present in this city. The other society was a scientific club rather than a druggists association. It got into a condition of dormant vitality. [Laughter]. It didn't die and isn't dead yet. They voted to remit all dues. The question came up among the officers whether another association should be called under the old regime or whether a new one should be formed. They decided in favor of the latter.

Mr. Northrup thought the trouble with the old society was it was too scientific, and not enough business. A society in his opinion, should, while advancing their professional interests, also give proper attention to trade questions.

Upon motion the Convention adjourned to 7.30 in the evening.

WEDNESDAY.

EVENING SESSION.

The meeting was called to order pursuant to adjournment. Prof. Prescott presented a list of queries for discussion.

The queries will be found elsewhere in this volume.

An informal discussion ensued upon the query relative to the preparation of tinctures and syrups from fluid extracts.

Mr. C. P. Parkill of Owosso said that at his store they had prepared syrups and tinctures from fluid extracts in some of those cases where the articles were so seldom called for, that the crude drugs of good quality could not well be kept in stock.

Mr. Parker (Detroit) said that whenever he attempted to make syrups from fluid extracts without the warrant of the Pharmacopæia he got a milky mixture.

Mr. Stevens (Detroit) said that, in his experience, when the fluid extract of one house would make a good tincture or syrup, the fluid extract of another house, with different menstruum, would give a bad result. He thought pharmacists should give more time and thought to making preparations to keep in stock, and in accord with the pharmaconceia.

Mr. Brown (Ann Arbor) said that he used this method for syrups only in case of those seldom called for but had found it usually satisfactory with the line of fluid extracts he kept in stock.

Mr. Jesson (Muskegon) said that for the past seven years he had manufactured his own perfumes at a saving of from one to three dollars per pound. It was his intention to prepare a paper embodying his formulas, whereby any druggist with a stock of material of from \$25.00 to \$50.00 could make his own perfumes. That he knew the formulas used by him were satisfactory, because, when he once made customers for his perfumes he was sure to hold them—but his time had been so pressing that he had been unable to prepare the paper.

Prof. Prescott moved that Mr. Jesson be requested to prepare his paper and publish in the proceedings. Mr. Saunders, he said, gave formulas in the A. P. A. proceedings for the manufacture of colognes and they were published everywhere. Motion carried.*

Mr. Parkhill referred to another query proposed by Prof. Prescott in relation to the use of petroleum oint ments. Before cosmolin came into market he was accustomed to use lard, but when he could get cosmolin it was so much more convenient that he substituted it in many ointments. He failed, however, to get the results expected, and soon became satisfied that the trouble was in the use of petroleum in place of lard. He discovered also that physicians complained and soon became satisfied that cosmolin was not adapted to a mucous surface.

Mr. Jesson said the great objection to petrolatum preparations was that they were not absorbed.

Mr. Parkhill had made a series of experiments. He could not get physiological effects; tried again with lard, which gave perfect results.

Prof. Prescott said it was generally understood that petrolatum was an admirable vehicle for cerates and ointments, because it never becomes rancid. It is a great annoyance to use lard since preparations made with it spoil so readily. Parraffins prevent absorption; because of some evidence confirmatory of this, the revisers of the Pharmacopeia did not give up lard. When absorption is not desired by the physician petrolatum is better if there be no pharmaceutical objections and when pure petrolatum can be obtained.

Mr. Jesson said one advantage in the use of petrolatum was its cheapness as compared with glycerin, thus yielding a larger profit.

Mr. Parker (Detroit) said one trouble in making petrolatum preparations arises from the differences in the petrolatum in the market. Where lighter preparations are used they are much easier to work and have given greater satisfaction. Physicians have complained that petrolatum irritates raw surfaces. Not so with the lighter bases.

A discussion followed upon the formulæ for syrup of tolu.

^{*}The paper will be read at the meeting in Detroit, on the 2d Wednesday of September, 1884.

Jacob Jesson.

Mr. Goodyear of Ann Arbor said that Parke, Davis & Co. made preparations well adapted for the manufacture of syrup of tolu and that like preparations were made by Burroughs of Baltimore by which the syrup could be easily and well made.

It was remarked that the formula of the new Pharmacopæia was not satisfactory.

Mr. Parker said that when liquors for syrup of tolu first came out, he had, after careful examination, failed to find any of them satisfactory.

Mr. White (Eaton Rapids) said that the only way to make clear syrup of tolu was to double the amount of magnesia used, filter and dissolve as much sugar as possible without forming a precipitate.

The topic of poison closets was then brought up for discussion.

Mr. Parkhill asked what was the best means of avoiding errors in respect to poisons. He knew of a case where an extended litigation arose on this question of keeping poisons.

Mr. White keeps his poisons mixed but with-skull-and cross-bones labels on the bottles. His strychnine is kept in its original package.

It was asked whether a chain fastened to bottle and stopper would not prevent mistakes. It was also suggested that corrugated bottles would answer better than colored, since some druggists were color blind.

Mr. Wolf (Hillsdale) said he kept his poisons in a separate closet. His fluid and solid extracts, tinctures and powders of poisonous nature had a skull-and-cross-bones beneath the glass label. If pharmacists would re-check prescriptions in addition to the foregoing precautions, errors would not occur.

Prof. Prescott said that the proceedings of the former association contained a list of poison labels with antidotes. He asked for information on the subject of registration. It was replied that the registration law was not generally obeyed.

Prof. Prescott said that the question might be raised as to what poisons should be registered. It was desirable that every poison like strychnine and arsenic should be labeled except in case of prescriptions which de facto constituted registration. The neglect of this matter has led to many lawsuits with disadvantageous results to druggists.

The question was raised as to what should be done in cases of a prescription labeled "to be taken by drops carefully."

Mr. Parkill registered only such poisons as would serve for suicide.

Mr. Jesson said he sells ergot only on a physician's prescription.

Mr. Prescott thought the discussions had been interesting and hoped that the queries accepted would be carefully responded to.

Adjournment to 8 o'clock on the following day.

THURSDAY.

MORNING SESSION.

The meeting was called to order 9 A. M, Chairman Wilson in the chair.

Pending the report of the Committee on Constitution and By-Laws, Mr. Riebe, of Ann Arbor, read a volunteer paper on the "Preparation of Syrup of Ginger," which was received and ordered published in the proceedings, should provision be made for such report by the Association when organized. The paper be found in this volume in the department of "Papers."

At the conclusion of the reading, Mr. Wells, of Ann Arbor, announced that the Committee on Constitution and By-Laws was ready to report. The report was read by Mr. Dodd, of Buchanan, and is published elsewhere as amended and adopted.

Mr. Mueller (Detroit) moved that the report be accepted and adopted as read.

Mr. Wells supposed there would be some discussion upon the report. If he understood the motion to adc pt, it would, if carried, make the draft submitted in the report the organic law of the Association. The Committee would feel much flattered if the report was adopted without amendment, but nevertheless it would seem wise to take up and consider the sections of the report seriatim.

Prof. Prescott offered an amendment to the pending motion of Dr. Mueller that the report be received and discussed seriatim. The amendment was accepted by Dr. Mueller and adopted.

The preamble was adopted without reading. Article I and Article II of the Constitution were adopted without amendment.

Article III was read as follows:

Every pharmacist of good moral character and standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

Referring to the article Mr. Gundrum suggested

that some provision should be made for those who had been, but who were not now, engaged in pharmacy.

Prof. Prescott explained that the scope of the section was ample to admit all engaged in the business, past or present.

Mr. White (Eaton Rapids) inquired if the clause "good moral and professional character" was intended to include men who imbibed intoxicating liquors.

Mr. Brown (Ann Arbor) asked if it were well to open the doors so wide. Under the section a boy fifteen years old could be admitted to full membership. He thought some age limit should be fixed.

Mr. Wells said this point had been considered by the Committee, with the conclusion that many young men under 21 years of age were competent pharmacists, and it would be unjust, therefore, to debar them from membership. The Association could rest assured that very few 15 years old applicants would appear, and even if they did their applications would need pass the scrutiny of the Executive Committee, when, if deemed best, they could be thrown out. The sole test in such case should be one of competency.

A vote being taken upon the article, it was adopted; also upon motion the remaining articles in order of the Constitution were adopted.

The By-Laws were then discussed. Articles I and II were adopted without amendment. Article III, making the initiation fee for membership \$1, was discussed at length.

Mr. Wolf (Hillsdale) moved that the amount of the fee be amended to read \$2 instead of \$1.

Mr. Wells said the Committee had also discussed this point. Many would think \$2 a large sum to pay, and would be deterred thereby from joining. Fix it at \$2 and they would make a close corporation of the society. By making the fee \$1 they would draw in a large company of men who might be benefited. It is the very class of men least able to pay large fees who could derive the most benefit from membership in the organization. If the Association is to do good, it should make its sphere as wide as possible.

Mr. Stevens (Detroit) thought that if the fee were placed so low, there would not be a sufficient surplus of funds to pay an adequate salary to the permanent secretary.

Mr. Jesson stated that seventy applications for membership had been forwarded to him on condition that the total of fees for the first year should not exceed \$3.

Mr. Stevens said there was no druggist unwilling to pay so small a fee as \$2 for initiation.

Mr. Watts (Grand Rapids) thought \$2 would be generally acceptable.

Mr. Perry (Detroit) moved to amend and make the fee \$2.

Mr. Alsdorf (Lausing) moved to make it \$3, which he said would be found none too large. All would join at any price when the advantages of membership were fully appreciated.

Mr. Gundrum was in favor of a \$3 fee, provided it was made to include one year's dues.

Mr. White (Eaton Rapids) suggested making the amount \$2 for charter members and \$1 for all joining thereafter.

Prof. Prescott thought the distinction between the initiation fee and the annual fee should be kept clear. He hoped they would not make the former fee \$3, as it would create a wrong impression. He did not consider it necessary to have as large a fee this year as perhaps in after years, for the reason that there would be relatively a much larger number of initiation fees paid in this year than in any subsequent years. The remarks of the chairman of the Committee commended themselves strongly to his favor. He suggested that the initiation fee and the annual dues be each placed at \$1. This would necessitate a return of \$1 to the gentlemen who had remitted \$3 with their applications, but this could be readily done.

Mr. Wells said it was intended by the Committee that the fee of \$1 for certificate of membership should be the perquisite of the Secretary.

Prof.Prescott thought as regards the salary of the Secretary, that officer should be paid for what his services are worth at a given sum per annum. If initiation and membership fees were each placed at \$1 and the certificate of membership at \$1 the sum would make the \$3.

Mr. Wells thought with the previous speaker that the combined fees of \$3 about right, and sufficiently moderate to draw into membership assistants from all parts of the State.

Mr. Northrup (Lansing) declared that the purpose for which they had assembled there to-day was unknown to "We reprenine out of every ten druggists in the State. sent men," he said, "who are doing a flourishing business; all druggists are not doing so well, and cannot afford to pay \$8 or even \$2 in fees. The initiation fee is in itself, perhaps, a small item to all present, but when you add traveling, hotel and other necessary expenses incident to the meetings, many less-favored druggists find themselves barred out. I hope the amount of \$3 will not prevail. As to the expense of printing the proceedings, manufacturers of pharmaceuticals are only too glad to get a fly leaf advertisement in the book. The expense of publication could be paid in this way." He was in favor of \$1 for initiation, and \$1 dues.

Dr. LeCaron was asked the experience of the Illinois Association in the matter of dues. He replied that they are \$1 each for initiation and annual dues, which are found sufficient for all expenses and leave a small surplus.

The various amendments to Article III proposed were withdrawn by the movers by common consent, and the question recurring on the original motion to adopt, it was carried unanimously.

Article IV, having been so worded as to leave in doubt whether the annual dues should be paid in advance, it was, on motion of Mr. Alsdorf, so amended as to require advance payments.

Article V was read as follows:

Every member of this Association may, upon the payment of one dollar, receive a certificate of membership, which shall be issued by the Secretary, provided said member is not in arrears for dues.

Prof. Prescott moved its adoption, with the understanding, however, that payment of the fee for a certificate of membership should not be compulsory. If the member wished to contribute \$1 he could do so.

Mr. Northrup thought the article should be made to read

each member of the Association shall be entitled to a certificate of membership, which shall be issued by the Secretary, provided the member is not in arrears for dues.

Mr. Brown (Ann Arbor) believed the section should be worded so as not to convey the idea of a compulsory fee, but to leave its payment wholly optional.

Mr. Gundrum said the cost of a certificate would be small. Another gentleman suggested that the former association had a stone it might sell for the purpose. Prof. Prescott said the stone was not in the market. [Laughter.]

It was also suggested that the Association should not provide for a surplus of cash in the treasury for the members to quarrel over. Poverty in the case of societies was a blessing and a peacemaker. Two dollars in fees would give ample funds.

Mr. Dodd (Buchanan) explained that the committee calculated there were 1,000 drugstores in the State, representing an aggregate of 2,000 men available for membership. If all should join, there would be a sufficient revenue, even though the fees were smaller than proposed. If outsiders are to be brought in, the fees must be placed at a minimum figure.

Mr. Hullinger (Mecosta) said there were eighteen druggists in his county; he saw but two present. There were thirty druggists in Hillsdale county; but few were in at tendance. The Association should make the invitation to these absentees not only cordial, but as nearly free as practicable. They must be persuaded that they will be benefited by membership. The recruits must be drawn from the ranks of the young as well as the middle-aged and old. No man should be prevented from joining through a high tariff on membership. He has two boys: he is too old himself to enter upon a new career of progress, but he wants his boys to enjoy every advantage. Give the young men every opportunity; make the expense as light as possible.

Mr. Wells said the receipts already amounted to \$300. To publish the proceedings would cost but a small part of this sum, and the salary of the secretary would not be much. More money is not needed. If fees should at any time be found inadequate, funds could readily be raised

for any contingency. He thought now is the time to economize. Certificates need not cost much.

G. W. Crouter (Charlevoix) declared against getting up anything shabby in the way of certificates. "If you get up anything, get it up nice." [Applause.] A full treasury, contrary to the assertion of a previous speaker, was, instead of a bane, a feature of interest—an attraction. He thought the optional fee idea a good one. [Applause.]

Mr. Jesson stated that he had noticed in the report of the Illinois Association that \$200 had been set aside to pay for printing precedings; that to publish the Michigan proceedings would cost at least \$125; that a certificate of membership would cost \$75 more—and if the fee were placed at \$100, and 50 cents for yearly dues, the Association would be out of funds at once.

After further discussion, Dr. Crouter moved the previous question on the amendment to make the certificate unconditionally free. The previous question prevailed, and a vote being taken on the amendment, it was lost, 30 yeas, 19 nays.

Mr. Northrup then moved that the section be so worded, as distinctly to state that it is entirely optional with members to procure certificates or not.

Mr. Dodd suggested in the spirit of the motion offered that the section be amended to read, "Every member, if he desires, may obtain a certificate," etc.

The motion in this form was adopted.

Articles VI and VII were successively adopted. Article VIII which provided for election of delegates to the American Pharmaceutical Association was amended to include delegates to the National Retail Druggists' Association.

The remaining articles were then adopted in order with out amendment. A discussion arose upon the order of business, delaying the election of officers to the last session.

Mr. Alsdorf thought this order in the wrong place. If at the close of the meeting, many would leave before it was reached.

Mr. Dodd said it was for this especial reason that the order was placed at the close—it would keep the members together until adjournment.

Mr. Wells thought the order under discussion an important one. As a gentleman had stated, many would not remain for it if placed at the close, and it was highly desirable that the largest number possible be present at the elections. There was a very manifest disposition even now to have the election precede other business.

Dr. Crouter was of the opinion that it would be extremely unwise to elect and install officers in the middle of a session. All should come prepared to remain until the sessions were over.

Prof. Prescott thought a strong argument in favor of the order as reported was that if the newly-elected officers were not installed until near the close of the session it would enable them to preside the longer at the next session, and in the meantime have an opportunity to qualify themselves for their respective positions.

Mr. J. S. Spenser (Linden) remarked that if at any time they found the order unwise, it could be easily and at once suspended by a two-thirds vote.

The final section was then adopted intact, and upon motion of Mr. Jesson, the Constitution and By-Laws, as reported and amended, were adopted as a whole.

Mr. Dodd moved a suspension of the rules to proceed to the election of officers for the ensuing year. Adopted.

On motion of Mr. Wells, an intermission of ten minutes was taken to enable all desiring to become members to register and pay their dues. Adopted.

On reassembling, the Chair appointed as tellers Messrs. Northrup, of Lansing; Latimer, of Ludington, and Safford, of Flint.

Mr. Alsdorf moved that Mr. Wilson, of Muskegon, be elected President by acclamation. The motion was declared out of order. He then moved that the Secretary be instructed to cast the ballot of the Association for Mr. Wilson as President.

Mr. Northrup thought it a poor time to violate the spirit of the Constitution. Mr. Alsdorf withdrew his motion.

Nominations being in order, Mr. White placed in nomination for President Mr. H. J. Brown, of Ann Arbor; Mr. Watts nominated Frank Wells, of Lansing.

At this point Mr. Gundrum raised the question whether

a majority or a mere plurality of votes was required to elect. The Constitution failed to specify. He moved that the candidate receiving the largest number of votes on the the formal ballot be declared elected.

Mr. Dodd hoped the motion would not prevail. The Constitution declared that unless otherwise specified, the usual rules governing deliberative assemblies should govern this Association. The usual rules referred to require a majority of all the votes cast to elect, and not simply a plurality. There might be twenty candidates in the field and the highest vote cast for any one candidate might be very small, in no wise reflecting the majority sentiment. The motion of Mr. Gundrum was lost and a motion requiring a majority of all votes cast, adopted.

The informal ballot for President resulted as follows: F. Wells, Lansing, 25; W. B. Wilson, Muskegon, 20; A. B. Prescott, Ann Arbor, 3; H. J. Brown, Ann Arbor, 4; scattering, 2. When the result of the ballot was announced, Mr. Wells expressed the hope that they would desist from voting for him on the formal ballot; others present were better qualified and more deserving of the honor.

Mr. Brown thought some older member should be elected; while expressing his thanks for the compliment paid him, he nevertheless desired to withdraw his name.

Prof. Prescott acknowledged his thanks for the votes cast for him, but declined to be a candidate and withdrew in favor of Mr. Wells.

On the formal ballot, Mr. Wells received 84 votes, Mr. Wilson 13, and Prof. Prescott 5. Mr. Wells was thereupon declared duly elected President of the Association for the ensuing year.

Mr. Wells, in rising to respond, was greeted with hearty applause. "I am," he said, "very grateful for the honor conferred upon me. Though unworthy of the position and confessing my lack of experience, I shall nevertheless discharge the duties of first President of the Michigan Pharmaceutical Association to the best of my ability, and to this end I ask your assistance, co-operation and forbearance. Again, gentlemen, I thank you."

The first formal ballot for Vice-President resulted in no choice. On the second ballot Mr. Dodd received 8

votes; A. B. Stevens, Detroit, 2; Isaac Watts, Grand Rapids, 30; W. B. Wilson, Muskegon, 18.

Mr. Watts was thereupon declared elected first Vice-President.

On motion of Mr. Brown, the vote for the remaining two Vice-Presidents should be by double ballo', the candidates receiving the two highest votes to be declared elected. The ballot resulted: I. H. L. Dodd, Buchanan, 34; W. B. Wilson, Muskegon 25; A. B. Stevens, Detroit, 17; scattering, 24.

Messrs. Dodd and Wilson were thereupon declared elected respectively Second and Third Vice-Presidents. Mr. Dodd briefly expressed his thanks for the honor.

On motion of Prof. Prescott, the chair was instructed to cast the ballot of the Association for Jacob Jesson, of Muskegon, for Permanent Secretary. Adopted.

Mr. Jesson—I thank you, gentlemen, for the compliment. I cannot make speeches, but if hard work will answer, I am with you. [Applause.]

The ballot for Treasurer resulted: Geo. McDonald, Kalamazoo, 4; Wm. Dupont, Detroit, 39; scattering, 8. Mr. Dupont was declared elected Treasurer.

Messrs. Prescott, Stevens, Dodd, Alsdorf, Hullinger, A. W. Allen, Crouter, McDonald, Brown and Safford were placed in nomination for members of the Executive Committee.

Prof. Prescott with Irew his name. Mr. Als lorf said Dr. Croater should be elected as a representative of the northern section. All sections should be represented: For the same reason Mr. Bours (Detroit) urged the claims of Mr. Wolf, of Hillsdale.

The formal ballot resulted in the election as members of the Executive Committee of G. W. Crouter, Charlevoix: O. P. Safford, of Flint; F. M. Alsdorf, of Lansing, H. J. Brown, Ann Arbor, and Geo. MacDonald, Kalamazoo.

The following were chosen delegates to the American Pharmaceutical Association: A. B. Prescott, Aun Arbor; Geo. Gundrum, Ionia; C. P. Parkill, Owesso; A. S. Parker, Detroit; Geo. McDonald, Kalamazoo.

Alternates :- F. W. Fincher, Pentwater; J. C. Mueller,

Detroit: O. Eberbach, Ann Arbor; G. W. Crouter, Charlevoix; A. W. Banks, Detroit.

Delegates to the National Retail Druggists' Association: F. Smith, Saginaw; F. W. R. Perry, Detroit; H. J. Brown, Ann Arbor; J. Q. Look, Lowell; C. A. Pinckney, Plymouth.

Alternates: Frank Inglis, Detroit; J. G. Wolf, Hillsdale; O. P. Safford, Flint; W. A. Severson, Buchanan; L. T. White, Eaton Rapids.

A discussion followed upon the time and place of next meeting.

Mr. Hullinger suggested Detroit.

Mr. Dodd thought a more central place should be selected—like Grand Rapids or Kalamazoo—though he preferred the former.

Mr. Wells said the druggists of Lansing were just beginning to feel acquainted. If the Association should decide to hold its next meeting in Lansing, they could offer a more generous hospitality. Lansing is centally located, has good railroad facilities and other obvious advantages. He moved as an amendment that Lansing be substituted for Detroit.

G. W. Crouter moved an amendment to the amendment in favor of Detroit. The city was a wholesale market, and Detroit would entertain well.

Mr. Stevens (Detroit) said if the meeting was held in Detroit, many druggists could combine business with pleasure in attending. The manufacturers of Detroit would do everything to make the stay of the members pleasant.

Mr. Hullinger observed that the main purpose of the next meeting would not be business, but legislation.

Prof. Prescott said he hoped the time of the next meeting would precede the fall elections.

The amendment in favor of Detroit was decided affirmatively, yeas, 28; nays, 17.

Mr. Dodd moved that the Detroit members present select one of their number to act as Local Secretary, and that the President be requested to cast the ballot of the Association for the person so selected. Carried.

After retiring for a few minutes the Detroit members re-

ported the name of A. W. Allen for Assistant Secretary. On motion the President cast the ballot of the Association for his election, and he was declared duly elected.

Prof. Prescott was requested to state why he wished the time of meeting next year to precede the fall elections. He replied that much effective work could be done in acquainting legislative nominees with the intent and character of the pharmacy bill to be presented for passage by the Legislature. The precise character of the bill would necessarily not be known until it shall have been determined by the Association next year.

Mr. Dodd moved that the question of time of meeting be referred to the Executive Committee.

Mr. Gundrum moved as an amendment that the time be the first Tuesday in October, 1884. That would be before election.

Mr. Wells suggested that it should be made later, since the Agricultural Fairs are in full blast at the time named-He thought the second or third Tuesday in October preferable.

After further discussion by Messrs. Northrup, E. F. Phillips, of Armada, and Dodd, it was decided to meet in Detroit on the second Tuesday in September, 1884, the first session beginning at 2 o'clock P. M.

Prof. Prescott desired the privilege of moving the election to honorary membership in the Association, of Messrs. H. Le Caron, of Braidwood, Ill., President of the Illinois Pharmaceutical Association, and G. P. Engelhard, of Chicago. Adopted.

Mr. Engelhard expressed his thanks and his high appreciation of honorary membership in an Association destined from the logic of events to a brilliant future.

A vote of thanks was tendered the temporary officers, Chairman Wilson, of Muskegon. To Jacob Jesson of Muskegon for the preliminary work in perfecting the organization. To Charles Wright, of Detroit, for his forethought and liberality in providing badges for the members, and to C. M. Alsdorf, of Lansing, for securing the House of Representatives' chamber to hold the convention in, and without whose co-operation, the convention could not have been made a success.

On motion the Convention adjourned to 1:30 o'clock P. M.

THURSDAY-

AFTERNOON SESSION.

The meeting was called to order at 2 o'clock, President Wells in the chair.

It was moved that the applications for membership received previous to the meeting in response to circulars issued with the formal call, which were accompanied with the required membership fees, be read.

The Secretary then read the following names: Geo. Swift, Detroit, W. R. Cutler, Ionia, H. . Hale, Nashville, D. E. Prall, East Saginaw, . F. D. S'evens, Detroit, E. V. Conley, Stephenson, E. T. Yeomans, Ionia, M. H. Bachman, Stanton, A. G. Clark, White Cloud, Geo. F. Seibert, Iron Mt. C. H. Wagener, Big Rapids, T. Rudolphi, Dowagiac, C. K. Merriam, Ludington, J. H. Wasson, Hoytville. John B. Quick, Howard City, J. J. Robbins, Hubbardton, H. Kephard, Berrien Springs, Ed. S. Cowan, St. Joseph, W. R. Phillips, Battle Creek, H. F. Bannard, Kalkaska, Ado'ph Gebhard, Big Rapids, O. B. Dickenson, G'd Haven Justin N. Mead, Escanaba, W. H. Keeler, Saginaw, W. S. Andrus, Utica. J. W. Murphy, Battle Creek, D. B. Perry, West Bay City, Geo. B. Mason, Saline. M. L. Herley, East Saginaw, Theo. Ronnefeld, Detroit, C. D. Wicker, Hillsdale. Henry Hawkins, Detroit, E. Batiram, Paw Paw, E. S. Hipkins, Blanchard. A. L. Greene, Ann Arbor, D. T. McDonald, Calumet, V. Roussin, Ludington, Chas. E. Sabin, Centreville. G.J. Parker, Pt. Huron. M. W. Steward, Cadillac, C. G Baier, Detroit. Fred D. Paquette, Cadillac, John Meyers, Mt. Clemens G. F. Cady, Pentwater, B. O. Gladding, Constantine, Wm. F. Todd, Flint, Albert Mann, Ann Arbor, I. J. Brown, Okema, A. M. Randolph, Northville, R. J. Sawyer, Menominee, J. P. Bertram, Westphalis, J. E. Gerow, McBride's, W. Rushmore, Elk Rapids. J. W. Briggs, Schoolcraft, A. W. Peck, Walton, A. McFarland, Detroit. J. H. H. Mottram, Detroit. Lee S. Willson, St. Joseph,

A. A. Dorrance, Coldwater. A. H. Lyman, Manistee,

J. H. Vandecar, No. Branch. Chas. R. Stevens, Nashville.

G. H. McMullen, Ionia. S. M. Snow, Ludington,

John W. Dunlop, Clare. W. B. Reynolds, E'n Rapids.

S. M. Sackett, Monroe. H. Beebe, Eaton Rapids.

H. A. Frank, Detroit.
W. G. Sprague, Flushing,
B. F. Buchanan, Harrisville. Joseph Schallar, Quinnisec.

Secretary Jesson reported that among the names were several firms, who could not be constitutionally elected.

It was decided, after discussion, that in such cases, the senior member of the firm be regarded as having made the application. Should this action be deemed unsatisfactory by firm applicants, the money to be refunded.

On motion of Secretary Jesson they were elected members of the Association.

Mr. Severson (Buchanan) desired a discussion upon the prevalent practice of cutting prices, especially on proprietary articles. If anyone present was given to the practice, he wished to know if they had ever derived any benefit therefrom.

Mr. Watts (Grand Rapids) said he was not of that class. He had never cut prices, and had never, to his knowledge, lost any trade from this policy.

Mr. Allen (Detroit) said one or two stores in that city make a business of cutting prices. This form of competition was unjust and to be deprecated. He never sold below the legitimate retail price, except to a few customers, in cases where competition made it appear expedient. In such cases, however, he would say the regular price was \$1 (or whatever it might be), but will sell for 90 cents. They had much of this kind of competition for a year or more, but he was glad to say they were now quite universally agreed on getting full prices. The cutting, where it existed, was now largely confined to a few hair preparations. The practice extended, in some instances, to the prescription business, but in these cases the dispensers were extremely liable to omit to put in standard ingredients. The Detroit druggists had organized a local society, through which they hope to improve themselves scientifically as well as commercially.

Mr. Parker (Detroit) said the druggists of that city were occasionally justified in shading prices, owing to compe-

tition from certain grocery houses. They made it a point to hold up prices, and shaded only when obliged to. Certain fancy goods, soaps, face preparations, and the like, were being sold by some houses at actual cost.

Mr. Covert (Paw Paw) said the cutting in his town was confined largely to granger stores.

Dr. Crouter declared that, if united on this question, they would be strong. A wholesale jewelry house of Chicago had sold goods contrary to a rule of the National Jewelers' Association. The association promptly suspended them for unmercantile conduct, and they were finally reinstated only under promise that they would not thereafter sell to outsiders. The speaker hoped the retail druggists of Michigan would soon become strong enough to be able to compel similar action on the part of wholesale drug associations.

Mr. Alsdorf (Lansing) thought they should not be too hard on the grangers until after they got their bill passed. [Laughter.]

The president observed that the question is one of vital importance and one that justified early action.

Mr. Parker, of Detroit, said that Mr. Jacob Jesson, of Muskegon, had been to an expense of \$54.00 for printing and mailing circulars and other incidental expenses connected with the preliminary work, and moved that he be allowed that amount.

Mr. Watts, of Grand Rapids, moved to amend the motion and make the amount \$75.00. Carried.

Mr. Watts moved that \$75 be appropriated for the salary of the secretary for the ensuing year. Dr. Crouter moved to amend by making the amount \$50. Adopted,

Mr. Watts said he wished it understood that the motion should comprise the words: "Exclusive of traveling expenses." Dr. Crouter stated they were not a part of his motion as adopted.

Mr. Phillips (Armada) moved that the president be one of a committee of three to design a suitable badge for members to wear at the annual meetings. The motion was lost.

Mr. Watts, recurring to the subject of maintaining prices, spoke of the objects of the National Retail Druggists' As-

sociation, and, upon request, read the constitution and bylaws of that organization.

At the close of the reading, S. E. Parkill, Owosso, offered the following resolution:

Resolved, That this association indorse the objects of the National Retail Druggists' Association, and commend the association to the support of the retail druggists of Michigan.

Mr. Watts remarked that what the National Retail Druggists' Association really needed was additional members with the additional funds and influence an increased membership would bring.

Mr. Severson said the druggists of Wisconsin, through their State association had undertaken to remedy the evil in question through local associations, and the adoption of a plan presenting a form of agreement for the maintenance of prices, a penalty of \$25 being attached for violations. He thought this plan embodied the elements of success; while they should not forget the National Retail Druggists' Association, they should, at the same time, not neglect individual local work.

The resolution of Mr. Parkill was adopted.

Mr. Spenser (Linden) said the question of jobbers selling to consumers was one of no small importance to retailers. A customer of his inquired what he would sell a dozen Hop Bitters for, and \$10 was quoted as the price. Being anxious to get a better price, the customer called on a certain jobber, and the latter quoted \$7.50, remarking at the same time that he had no customer at Linden, and therefore could not injure his patrons by so doing. Many small general stores through the country keep a lot of patent medicines which they sell at cut prices. The speaker thought agreements of little avail, unless all dealers in a town or locality can be induced to sign. The competition from the cities and towns was less baneful than that from the cross-roads stores carrying a stock of \$40 or \$50 worth of patent medicines.

Mr. Northrup (Lansing) instanced a customer calling at his store and inquiring the cost of oil cake. Having given him a fair retail price, the customer next wrote to a certain Detroit jobbing house and secured a price fully as low as had been quoted to him (Mr. Northrup).

Mr. Dodds (of Swift & Dodds, Detroit,) said that, as a representative of the Detroit wholesale trade, he desired to state that jobbers could not always know from what class or occupation of men orders came. He had established a rule in his business that if a stranger called at their store with a view of purchasing, the first question asked him would be how much he wanted to buy. If an original package or jobbing quantity, he was given a jobbing price. If a smaller quantity or package, he would be refused unless he could prove he was in trade. The speaker thought the jobbers entitled to some consideration, and to exemption from charges not grounded on fact and justice.

Mr. Severson knew there were some houses who resolutely refused to sell to consumers. For his part, he would not deal with any firm pursuing a different policy.

Mr. Watts believed wholesalers should exercise more care in selling only to retail dealers. They have a right to expect it from the men they patronize.

Mr. C. P. Parkill said he bought goods where he could get them cheapest, in accord with the trade axiom, "Goods well bought are half sold."

Mr. Watts moved that the pharmacy bill be referred to the Committee on Legislation for a report upon its provisions at the next meeting. Adopted.

The gentleman also remarked that he had submitted the draft to a number of conservative gentleman, who declared their sympathy with it, when told, in answer to a question, that it would tend to abolish the selling of intoxicating liquors by druggists.

On motion of Mr. Parkill, the secretary, in conjunction with the executive committee, was authorized to print as many copies of the proceedings as they might deem best.

On motion of Prof. Prescott the pharmacy bill was ordered printed in the proceedings.

The chair announced the following committees:

Trade Interests—F. W. Fincher, Pentwater; J. C. Mueller, Detroit; Geo. McDonald, Kalamazoo.

Pharmacy and Queries—A. B. Prescott, Ann Arbor; A. B. Stevens, Detroit; Geo. Gundrum, Ionia.

Legislation. W. B. Wilson, Muskegon; C. P. Parkhill, Owosso; H. J. Brown, Ann Arbor.

The secretary, upon motion, was authorized to insert advertisements of reputable firms in the proceedings.

A vo'e of thanks was given the Committee on Constitution and By-Laws; also to the Board of State Auditors for the use of the capitol, and to the Lansing press for its reports of the proceedings.

The president congratulated the association upon the encouraging auspices under which it began its being. It certainly augurs well for a successful future. If each member will go home and constitute himself a committee of ten on membership, the association would increase and enjoy lasting prosperity. [Applause.]

The meeting then adjourned.

NOTE.

By an oversight of the Secretary Prof. A. B. Prescott's paper, on page 47 of proceedings, was not ordered published by the Association, but is now added to the proceedings, by order of the undersigned. G. W. CROUTER,

GEO. McDonald, F. M. Alsdorf, O. P. Safford,

H. J. Brown,

JACOB JESSON, Secretary.

Executive Com.

PAPERS.

ON THE STRENGTH OF OPIUM AND ITS PREPARATIONS IN THIS COUNTRY, AS COMPARED WITH THE STANDARDS OF THE PHARMACO-PCEIAS OF 1870 AND 1880.

BY ALBERT B. PRESCOTT.

In the inquiry before us, we have to ask: First, what are the percentages of morphine, and of moisture, in crude opium? It is in the primary form of crude opium that the article is imported into the United States, subject to inspection at the Custom House. This inspection is made under the law of Congress "to prevent the importation of adulterated and spurious drugs and medicines"-a law in force since 1848. Holding that a drug of deficient strength is an adulterated or spurious drug, the authorities of the customs decided upon the minimum limit of strength, namely, nine per cent. of morphine in the crude opium, and have not admitted opium of a weaker power into the country. For about thirty-five years, then, opium containing less than nine per cent. of morphine has been contraband at the ports of entry. There seems to be no evidence that this regulation of the Custom House has failed to be executed. At all events, the evidence presently to be submitted is quite conclusive that at the present time, and for some few years past, opium of less than nine per cent. of morphine very rarely enters the country. It would be very difficult to maintain by law the standard of quality of any drug originating within the country, as steadily and effectually as the standard of an imported drug can be maintained by the customs service. It is somewhat remarkable, however, that this standard strength of opium and its successful maintenance appear to have

long escaped the attention of the pharmacists of the country, as represented in the revision of the Pharmacopæia.

The first requirement of strength of opium in the U.S. Ph. was in the Revision of 1860, for opium in its naturally moist condition, not less than seven per cent, of morphine. This was indeed a strange state of affairs—the general gov ernment taking care that no opium of less than nine per cent of morphine should enter the country; and the pharmacists assuming to give official credit to opium of seven per cent. of morphine. Now the moisture of "gum opium" ranges between 17 and 28 per cent. Dr. Squibb has placed the average loss of water, from the better grades, at 20 per cent. A loss of 25 per cent. is not at all uncommon. Then the strength of crude opium is to dried opium (which is nearly represented by powdered opium) as 4 is to 5, or possibly as 3 is to 4. Seven per cent, of the crude drug of average moisture, is equal to 8.75, or at most 9.3 per cent. of the dried drug. In the Revision of 1870, the Pharmacopæia required that opium, when dried at 212° F. to a constant weight, should have not less than ten per cent. of morphine, as found by the official process of preparing this alkaloid, a method known as Staples' process of assay. This requirement is slightly higher than that of 1870, but still presents the inconsistency of assuming to authorize dried opium of 10 per cent. morphine when the poorest legally imported opium of average moisture would give after drying 11.25 to 12 per cent. of morphine.

The standard of ten per cent. for dried opium was a very convenient one. It had the benefit of accord with the decimal ratio of numerical language. We are all very familiar with it, when we think of opium. If the revision of 1880 had been empowered to adjust the strength of opium at will, and quite irrespective of objective realities, there would have been a strong temptation to define opium at one fixed standard of a tenth of morphine in the dried drug, bringing it all to the minimum limit already official. The National Convention of May, 1880, with its large preponderance of delegates from medical organizations, directed that a maximum as well as a minimum percentage of morphine in opium should be prescribed (U. S. Ph., p. xxii). It was well known that opium of high percentages

of morphine was not uncommon, and it was certainly as important to guard against over-strength as under-strength. But as the work of the revision went on, the difficulties in the task of defining limits to the strength of opium as it is, became more obstinate. What shall be done with crude opium of 12 to 14 per cent. of morphine—giving a dried powder of 16 to 18 per cent.?

In January, 1882, Dr. Edward R. Squibb, under the heading, "The Strength of Opium, and the New Pharmacopæia,"2 presented a strong array of facts and arguments, upon which he based the recommendations: (1) That the pharmacopæial limits of crude opium should be "not less than 9 per cent. nor more than 15 per cent. of morphia by the officinal process of assay." (2) That a powdered opium be defined and restricted to contain "not less than 14 nor more than 18 per cent. of pure morphia by the officinal process of assay." He presented results of 230 cases of low-grade opium (which had been objected to on account of its appearance), and which gave an average of 10.29 per. cent. of morphine, equal to 12.45 per cent. in its dry state. Eight lots of 191 cases gave from 9.6 per cent. to 11.1 per cent.; average, 10.25 per cent.; equal to 12.35 per cent. in dry state. And Dr. Squibb further deduced from therapeutic experience of powdered opium, in comparison with morphine, the conclusion that the former contains 14 to 17 per cent. of the latter.

In May, 1882, Mr. Charles W. Parsons reported the assay of twenty-one Turkish opiums, with an average of 11.7 per cent. of morphine in the naturally moist opium, and 15.2 per cent. in the dried opium. Two of these opiums, however, ran slightly below 9 per cent. morphine. In these assays the process of analysis used was that which has been adopted in the Pharmacopeia.

Additional reports of assays have since been published by Dr. Squibb, from time to time, last year and this, of ten opi um assays, with results as follows: In crude opium, lowest, 9.8 per cent.; highest, 14.08 per cent.; mean (as I find it), 12.04 per cent. In dried opium: Lowest, 12.0 per cent.;

² Ephemeris, 1, 2-14.

³ Ephemeris, 1882 and 1883, pp. 55, 175, 290.

highest, 18.3 per cent.; mean, 15.4 per cent. Dr. Squibb's method of assay in his hands, gives a result a little higher than the process of the Pharmacopæia.

It is not often that an important drug is found to have a greater value than its dealers generally claim for it. And it is not often that the Pharmacopoeia finds its standards to be notably below uniform qualities of goods on the market.⁵

But now, with all these data as to the strength of crude opium, fresh from the importer's hands, what had been for year after year the strength of powdered opium? Had this been let down to the 10 per cent. of the Pharmacopæia? Was there not an opportunity for a wide-awake dealer to buy a hundred pounds of crude opium, and sell, from the same, a hundred and twenty pounds of powdered opium; and for this to plead justification, in that he would still sell official opium, of 10 per cent. of morphine? Well, to do this, something must be added to the powder to bring it down. What could be added? If the article is to be sold simply as powdered opium, there could be no justification, either under the Pharmacopæia or under true interpretation of the language of the contract, in adding anything that is not opium to the powder. If the article is presented as a graduated powder of opium of 10 per cent., or other stated strength by assay,-then of course it would be entirely legitimate. But men of prudence would buy a "Graduated Powder" only of dealers in whom implicit trust could be placed. Mixtures are distrusted. As a matter of fact, it may be said that the only parties who have diluted powdered opium, to be sold simply as opium, and not claiming to be assayed opium, have been those who regarded neither the requirements of the Pharmacopæia, nor those of com-

⁴In the hands of other workers the process of Dr. Squibb gives higher results than the U. S. Ph. process, with some opiums, and in some trials, but I have not found it to do so uniformly. In one trial the same opium was worked by three men, who used Squibb's process (Ephemeris, 11), and by three other men worked by the U. S. Ph. process, each worker making the opium assay for the first time, but having experience in analytical work. The results by the U. S. Ph. process were, respectively, 13.50, 13.30 and 13.17 per cent. By the other process, 15.06, 12.65 and 12.97 per cent.

^{*}It is notable that the lower limit for morphine in crude opium, given by the British Pharmacopeia of 1867-74, by its own method of assay, is "at least from six to eight" per cent., while the German Pharmacopeia of 1872, and again that of 1892, requires, in dried opium, only 10 per cent. of morphine.

mon truthfulness, as to any powdered goods. And powdered opium does not seem to have specially suffered at unscrupulous hands. Dr. Squibb obtained for assay powdered opiums "from eight of the largest wholesale drug houses in Philadelphia and New York." Seven of these had 12.5 to 15.1, average of 14.1 per cent. of morphine. The eighth gave only 9.5 per cent. of morphine, and was evidently adulterated with a gummy substance. Fortunately, then, it appears that no great harm had been done by the under-statement of the minimum strength of the opium in the Pharmacopæias of the past. But it became, to quote again from Dr. Squibb, "very important to see what the Pharmacopæia of 1880 will do" for the future.

It was a situation in which it was necessary to alter the requirements of the Pharmacopœia, to avoid conflict with the even standards of good commerce,—to change the code in order that commercial practice should not be changed. And it was in the best endeavor to exercise implicit conservatism that crude opium was defined at the custom house standard of 9 per cent. minimum without maximum limit, and powdered opium, at the lowest estimate of corresponding strength, 12 per cent. minimum, and a maximum limit of 16 per cent., while denarcotized opium, as a preparation, was to be standardized by assay to the mean fixed limit, 14 per cent.

The number of assays before us is sufficient to show that these standards simply recognize and define the legitimate opium of this country as it is found, and if any legally-imported and properly-handled opium at all is ruled out by the present Pharmacopæia, it is the powdered state of a limited number of very rich opiums,—liable to give overdoses; it is the upper limit and not the lower limit which is most likely to be violated by honest opium.

We have to ask next, How do the tinctures of opium compare with past and present Pharmacopœial standards? It will be observed that neither the Pharmacopœia of 1870

^{*&}quot;Should the Pharmacopæia for 1880 adhere to the present minimum of 8 per cent, that is 10 per cent for dried opium, and should the bill to prevent adulterations now before Congress, become a law, and thus repeal the present 9 per cent. law; and should the New Pharmacopæia adopt a standardized opium with a standard so low as 10 per cent., it would not only materially disturb, but would revolutionize the preparations of opium,"—Ephemeris, January, 1882, p. 6.

nor that of 1880 grants any permission to take anylless opium for a pint of tincture because the opium is a very strong one. The directions are to take just so much of dry or powdered pharmacopæial opium for a given quantity of tincture. As the opium varies in strength, so will the tincture vary. To be sure, it is a perfectly proper thing to do, to make, and to sell, and to use a "graduated tincture of opium," adjusted, by assay, to the minimum strength of pharmacopæial opium, or, now, to the mean strength of official powdered opium, provided only this be declared in the name and label of the tincture. But this procedure in making common "laudanum" can plead no direction of the Pharmacopæia to justify it; it can only plead an attempt to conform to the official minimum limit, or the official mean of strength,—by unofficial means.

Still, it may be asked, have not makers of laudanum actually graded down its strength either to 3.75 gr. morphine to the fluid ounce, corresponding to the lower limit of U. S. Ph., 1870, or to 4 gr. morphine to the fluid ounce, the round number near above? And, if so, may not changes of strength, dangerous to patients, result from enforcement of the U. S. Ph. of 1880.

The change in the proportion of opium to tincture is this, from 8.60 per cent., 1870, to 10 per cent., 1880. The National Convention, with its preponderance of medical representatives, made the motion for this change in the direction, "in the liquid opium preparations, excepting paregoric, the strength of 10 per cent. shall be adopted if found advisable." (U. S. Ph., xxii). Whether advisable or not this change has been introduced. It is not in itself a very great change. But it will be observed that tincture of opium has suffered no change of strength at the hands of the Pharmacopæia, except the change from near nine to ten in the hundred, in the ratio of opium to tincture. The opium taken (when not graduated by assay) is the same article now that it was under the revision of 1870, when, indeed, there was no maximum limit which the powdered, opium now has. Taking dried opium, or opium powder, of 12 per cent. morphine, the grains of morphine, and of crystallized sulphate of morphine in one fluid ounce of the tinctures, will be as follows, disregarding inevitable waste:

By U. S. Ph. of 1870, 4.5 gr. morphine, or 5.6 gr. sulphate. By U. S. Ph. of 1880, 5.2 gr. morphine, or 6.5 gr. sulphate.

Within a year past there have been a few instructive reports, in the Eastern States, upon the strength of laudanum in actual use. Mr. Henry B. Parsons reported to the New York State Association the strength, gravities, etc., of 48 laudanums.⁷

These were all dated and made under the U. S. Ph. of 1870. Twenty-one of them contain 3.5 gr. morphine, or over, to the fluid ounce. These were honestly made, without doubt. The opium was not perfectly exhausted in some of them, and may not have been wholly dry in some of them. Ten had above 4 gr. morphine to the fluid ounce. One had 7.4 gr. to the fluid ounce. Seventeen samples had 2.3 to 3.3 gr. to the fluid ounce, a strength representing one avoirdupois ounce of moist opium to the pint. Seven had between 1.3 and 2.2 gr., representing "half strength." And two had even less than 1.3 gr. to the pint, not representing anything very definitely.

Miss Marie O. Glover, an analyist with Dr. Squibb, reports8 the assay of 17 laudanums gathered from eight wholesale drug-houses of New York, and eight of Boston. These were issued since the publication of the Pharmacopæia of 1880. Of morphine to the fluid ounce, one had 6.06 gr.; six had 5.24 to 5.87 gr.; two had 4.29 to 4.77 gr.; four had 3.29 to 3.95 gr., and three had 2.62 to 2.87 grains. Here about one-fifth of the preparations are much below the strength of U.S. Ph., 1870; while 44 per cent. nearly or quite reach the standard of the U.S. Ph., 1880. Surely the change in opium strength made by the Pharmacopæia is small in comparison with the variations which go beyond any phar-The unwarranted issue of "half macopœial warrant. strength" laudanum is liable, by its consequent toleration of large doses of the tincture, to cause subsequent administration of overdoses.

In conclusion, it may be remarked that it is somewhat remarkable that so potent and so expensive a drug as opium, having such wide variations of strength, has not to a

⁷ New Rem., xii., 194. (Other references.)

⁸ Am. Jour Phar., lv., 481, October, 1883.

greater extent been sold and administered upon assay of its value. Fertilizers for the ground are commonly assayed, and ores of even the cheapest metals are treated only by assay, but the sheet-anchor of the materia medica goes mainly at haphazard between limits quite too wide apart.

If both the neglect of chemical valuations of opium, and the very low standards of opium in European and United States Pharmacopæias have been due to faultiuess of assay methods, it is to be hoped that the improved processes of estimation of morphine now in use may bring about a more just administration of this important medicine.

PREPARATION OF SYRUP OF GINGER.

BY CARL RIEBE, ANN ARBOR.

The following paper refers to a modification of the officinal process of preparing aromatic syrups from fluid extracts.—Syrupus Zingiberis, for instance:

The process of preparing aromatic waters by means of paper pulp is an old one, and 1 refer to it only as an introduction to the following manipulation. In using cotton according to the direction of the U. S. P. '80, no satisfactory results could be obtained, but by saturating small fragments of filter paper waste with the oil, adding the specified quantity of water, shaking repeatedly, macerating several days and filtering, aromatic waters, fully saturated and entirely clear, were obtained, some samples of which I take the liberty to present.

The same process with slight alterations was extended to the preparation of aromatic syrup from fluid extracts like ginger, and other resinous substances, the object being to avoid the use of magnesium carbonate. The new U.S. P. directs taking up the fluid extract by a given weight of sugar, expose the mixture to a heat not exceeding 60°. C, add a given weight of water, shake, and filter. No satisfactory result could be obtained in following these directions, the syrups remaining opaque in spite of repeated filterings. Therefore the following modus operandi was resorted to: As in the preparation of aromatic water, small

pieces of filter-paper waste contained in a wide-mouthed bottle, of sufficient size, were saturated with the weight of fluid extract, specified by the new U. S. P., i.e. 2 pts., and exposed to a heat below 60° C, until all the alcohol had evaporated; then the given quantity of water, i. e. 35 pts., was added, the contents shaken repeatedly and allowed to macerate for 24 hours. Liquid and pulp were then transferred to a strainer, and allowed to drain off. The paper pulp was then packed firmly and evenly into a percolator (the lower part of which contained a layer of fine purified sand); the strained liquid foamed on the top and percolated through pulp and sand, adding enough water through the percolator to make the product weigh 35 parts. An entire ly clear, watery extract was the result, in which 65 parts of sugar were dissolved by agitation to finish the syrup, resulting in a perfectly clear, well-flavored preparation, as the sample herewith presented demonstrates.

Some other non-officinal syrups like Yerba Santa. were prepared on the same plan, with satisfactory results.

#LIST OF QUERIES.*

To be reported upon at the second annual meeting of the Michigan Pharmaceutical Association to be held at Dewoit, Sept. 9, 1884.*

- 1. What bad results follow the use of glucose sugars in making syrups?
- 2. To what extent is the practice of preparing tinctures and syrups from fluid extracts objectionable? Accepted by Ottmar Eberbach, Ann Arbor.
- 8. What solid extracts are most favorable to preparation by the dispensing pharmacist?
- 4. What encouragement is there for the dispensing pharmacist to prepare fluid extracts? Accepted by A. B. Stevens, Detroit.
- 5. Does the bromide of potassium in use answer to the tests of the Pharmacopœia? Accepted by A. L. Green, Ann Arbor.
- 6. To what extent is an alkaline reaction of bromide of potassium objectionable at the prescription stand?
- 7. What is the purity and strength of the lactic acid in use? Accepted by A. B. Lyons, Detroit.
- 8. Does the phosphoric acid of the market bear the pharmacoposial tests for strength and purity? Accepted by Hugo Thum, Grand Rapids.
- 9. Reports on the collection of crude vegetable drugs, from wild and cultivated plants in this State, are desired. Accepted by F. W. R. Perry, Detroit.
- 10. Could wintergreen be profitably collected and worked in this State?

^{*}Any Pharmacist who will accept any query in this list not mentioned as already assigned, will please notify A. B. Prescott, Ann Arbor, Chairman of Committee.

- 11. Does the bi-sulphate of quinine in use bear the tests of the Pharmacopœia? Accepted by F. M. Alsdorf, Lansing.
- 12. What are the highest percentages practicable for sulphurous acid in watery solution, what are the corresponding specific gravities, and how can the solution be best preserved? Accepted by Charles Riebe, Ann Arbor.
- 13. Is "Black Antimony" still in use in dispensing pharmacy? If so, what is its character? Accepted by George Gundrum, Ionia.
- 14. Are there now grades of wood alcohol pure enough for use in preparations where the alcohol is not to be retained?
- 15. What advantages has the use of quinine, free alkaloid, on the score of taste?
- 16. Are the borates, now prepared for the preservation of foods, harmless in constant use? Accepted by J. J. Goodyear, Ann Arbor.
- 17. Are there any pharmaceutical difficulties in the employment of petrolatum in cerates and ointments? To what extent do physicians adopt it? Accepted by A. S. Parker, Detroit.
- 18. Is the New Pharmacoposial process for the preparation of essential waters a satisfactory one?
- 19. What is the strength of tincture of opium sold in this State? Accepted by A. W. Banks, Detroit.
- 20. Would it be well to have effloresced sulphate of quinine introduced to avoid variation in dryness?
- 21. The mustard paper of the Pharmacopæia, is the process a good one, and is it advisory for the dispensing pharmacist to prepare it? Accepted by Geo. McDonald, Kalamazoo.
- 22. A report on the cantharides paper of the Pharmacopœia is desired.
- 23. Is the chloral hydrate in crust more likely to become acid than that in crystal? Accepted by Wm. H. Dodds, Detroit.
- 24. What materials and manipulations are best for the turpentine emulsions? Accepted by George Gundrum, Ionia.

- 25. Is it desirable that the constituents of proprietary medicines be required upon the label?
- 26. To what extent do the pharmacists of this State register the sale of poisons, and how far are they liable for failure to do so? What articles should be regarded as poisons for registration of sale? Accepted by W. J. Brown, Ann Arbor.
- 27. How far is it expedient for pharmacists to manufacture their own perfumes, and what formulæ can be proposed for the preparation of these articles? Accepted by Jacob Jesson, Muskegon.
- 28. What is the morphine strength of the crude and powdered opium in use in this State? Accepted by A. B. Stevens, Detroit.
- 29. Do preparations of aloes with bicarbonate of potassium or sodium lose medicinal power in losing their bitterness?
- 80. How can Fluid Extract of Liquorice be used the best to cover the taste of quinine? Accepted by N. Vandenbelt, Detroit.
- 31. Reports upon any of the specific gravity tables of the Pharmacopoeia are desired. Accepted by A. B. Lyons, Detroit.

CONSTITUTION AND BY-LAWS,

AS AMENDED AND ADOPTED.

PREAMBLE.

WHEREAS, organization, concert of action, and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore

Resolved, That we, druggists of the State of Michigan, in convention assembled at Lansing, organize ourselves into such an association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II

The objects of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard and ultimately to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.

Every pharmacist of good moral and professional standing, whether in business on this own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.

The officers of this association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected at the regular annual meeting of the Asso-

ciation, by ballot, and to serve until their successors are elected.

ARTICLE V.

Section 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, call special meetings at the written request of twenty-five members, shall present at each annual meeting a report of the Association and

perform such other duties as pertain to the office.

SEC. 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and, in conjunction with the Executive, shall superintend such publications as the Association shall direct. He shall notify members of their election, also notify members of committees of their appointment and election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts. Keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee.

SEC. 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury, when called upon by the Executive Commit. tee. He shall give a sufficient bond subject to the approval of the Executive Committee.

SEC. 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association

committed to their care.

SEC. 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.

This Association may establish for its future government and regulation such by-laws not in conflict with this constitution, as may be deemed proper and desirable.

ARTICLE VIII.

Every proposition to alter or amend this constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this constitution.

BY-LAWS.

ARTICLE I.

Twenty members shall constitute a quorum.

ARTICLE II.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy, shall be presented to the Association in writing, signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee, the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for election.

ARTICLE III.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary, and the applicant shall subscribe to the constitution and by-laws before the end of the next annual meeting.

ARTICLE IV.

Every membr shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member), each to consist of three members, viz: Committee on Trade Interests, Committee on Pharmacy and Queries, Committee on Legislation.

SEC 2. Committee on Trade Interests shall report at each annual meeting, such observations and information upon that subject as may seem to them of interest to the Association

SEC. 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable to be reported upon at the next annual meeting.

SEC. 4. The Committee on Legislation shall keep a record of and compile for reference, the enactments of the different States regulating the practice of pharmacy, and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.

SECTION 1. These by-laws shall not be suspended without the consent of two-thirds of the members present.

SEC. 2. Any amendment to these by-laws must be made in writing, and read before the Association, at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two.thirds of the members present, it shall become a part of these by-laws.

ARTICLE VIII.

Five delegates and five alternates shall be annually elected to attend the meetings of the American Pharmaceutical Association. Also to attend the National Retail Druggists' Association.

ARTICLE IX.

The proceedings of the Association, the roll of officers, committees and members shall be published annually under the supervision of the Secretary and Executive Committee, and a copy of the proceedings sent to each member of the Association.

ARTICLE X.

Any member may be expelled for improper conduct or any officer removed from office, for violating the constitution or by-laws, but no person shall be expelled or removed except by a two-thirds vote of all the members present at a regular meeting, and after he shall have been given an opportunity to be heard in his own defense.

ARTICLE XI.

The Association invites manufacturers and others to exhibit at the annual meeting, crude drugs, chemical, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SEC. 2. The Order of Business shall be as follows:

1. Calling roll of members,

- 2 Reading of minutes of previous session.
- 3. Address of retiring President.
- 4. Applications for membership.5. Election of members.

- 6. Reports of officers and committees.
- 7. Miscellaneous Business.
- 8. Reading of communications
- 9. Election of officers.



ROLL OF MEMBERS.

[Members are requested to report any inaccuracies in this list and notify the Secretary of any changes in addresses.]

Alsdorf, F. M., Lansing. Andrus, W. S., Utica.

Banks, A. W., Detroit. Bachman, H. H., Stanton. Bartram, E., Paw Paw. Bower, Manley, Clarkston. Brown, H. J., Ann Arbor. Brown, I. V., Galesburg. Briggs, J. W., Schoolcraft. Bullard, E. A., Vassar.

Cady, G. F., Pentwater. Carman, N. F., Lansing. Champney, A. R., Detroit. Conley, E. V., Stephenson. Crouter, G. W., Charlevoix. Cowan, E. S., St. Joseph.

Douglas, F. M. Bancroft. Deitz, Geo. A., Cadillac. Dodd, I. LeRoy H., Buchanan. Dodds, John J., Detroit. Dorrance, A. A., Coldwater. Dupont, Wm., Detroit. E.

Eberbach, O., Ann Arbor. Fincher, F. W., Pentwater. Francis, J. L., Ypsilanti.

Allen, A. W., Detroit.

Baier, C. G, Detroit. Bannard, H. F., Kalkaska. Beebe, H., Eaton Rapids. Bours, A. L., Detroit. Bertram, J. P., Westphalia. Brown, I. J., Okema. Buchanan, B. F., Schoolcraft.

Calkins, A. W., Detroit. Chamberlain, G. T., Hartford. Clark, A. G., White Cloud. Covert, C. F., Paw Paw. Cutler, W. R., Ionia.

D. Davis, G. L., Lansing. Dickenson, O.B., Grand Haven Dunlop, John W., Clare.

F.

Forcest, G. W., Chase. Frank, H. A., Detroit.

Gerow, J. E., McBride. Gebhard, A. E., Big Rapids. Gladding, B. O., Constantine. Goodrich, L. C., Kalkaska. Goodyear, J. J., Ann Arbor. Greene, A. L., Ann Arbor. Gundrum, Geo., Ionia.

H.

I.

K.

Harvey, H. D., Bangor. Hale, H. G., Nashville. Hendricks, F. H., Edmore. Herley, M. L., East Saginaw. Hicks, W. H., Morley. Hipkins, E. S., Blanchard. Humphrey, C. E., Jackson.

Hamilton, C. W., St. Charles. Hawkins, Henry, Detroit. Hewett, L. E., Lansing. Hullinger, James, Mecosta. Hyde, A, O., Marshall.

Inglis, Frank, Detroit.

Jesson, Jacob, Muskegon. Judson, F. E., Brighton.

Jones, E. L., Battle Creek.

Keeler, W. H., Saginaw.

Kephard, H., Berrien Springs

Latimer, F. N., Ludington. Lumbard, W. D., Jackson.

Look, J. Q., Lowell. Lyman, A. H., Manistee. M.

Mann, Albert, Ann Arbor. McDonald, Geo., Kalamazoo. McDonald, D. T., Calumet. McFarland, A., Detroit. Merrell, F. P., Hartford. Merriam C. K., Ludington. Meyers, John, Mt. Clemens. Millspaugh, G. D., Marshall. Mottram, J. H. H., Detroit. Mueller, J. C., Detroit.

Mason, Geo. B., Saline. McMullen, G. H., Ionia. Merrill, M. C., Bancroft. Mead, Justin N., Escanaba. Millington, F. S., Paw Paw. Murphy, J. W., Battle Creek. N.

Northrup, Burr D., Lansing.

P.

Parkill, S. E., Owosso. Parker, A. S., Detroit Paquette, D Fred, Cadillac. Perry, D. B., West Bay City. Perry, F. W. R., Detroit. Phillips, E. F., Armada Pinkney, C. A., Plymouth. Price, O. J., Detroit.

Parkill, C. P., Owosso. Parker, G. J., Port Huron. Peck, A. W., Walton. Phillips, W. R, Battle Creek Prall, D. E., East Saginaw. Prescott, A. B., Ann Arbor

Q.

Quick, John B., Howard City.

Raider, J. F. A., Newaygo.
Reynolds, W.B., Eaton Rapids. Riebe, Carl, Ann Arbor.'
Robson, W. L., Williamstown. Robbins, J. J., Hubbardston.
Ronnefeld, Theo., Detroit.
Roussin, V., Ludington.
Rushmore, W., Elk Rapids.
Randolph, A. M., Northville.
Robbins, J. J., Hubbardston.
Ross, E. W., Detroit.
Rudolphi, T., Dowagiac.

8.

Sabin, Chas. E., Centerville.
Safford, O. P., Flint.
Scholler, Joseph, Quinnesec.
Scholler, Joseph, Quinnesec.
Severson, W. A., Buchanan.
Smith, Fletcher, Saginaw.
Spenser, J. L., Linden.
Stevens, A. B, Detroit.
Stevens, Chas. R., Nashville.
Stewart, Marshall W., Cadillac.
Sawyer, R. J., Menominee.
Stevens, G. M., Monroe.
Sawyer, R. J., Menominee.
Stevens, G. M., Monroe.
Sawyer, R. J., Menominee.
Stevens, F. M., Clarkston.
Sprague, W. G., Flushing.
Stevens, F. D., Detroit.

Т.

Todd, Wm. F., Flint. Tubbs, C. C., Chesaning. Tuttle, W. A., Williamstown.

v

Vandecar, J. H., North Branch.

W.

Wagener, C. H., Big Rapids. Walker, W. K., Utica. Watts, Isaac, Grand Rapids. Wicker, C. D., Hillsdale. Willson, Lee S., St. Joseph. Wolf, John G., Hillsdale.

Wallace, A, S., St. Johns.
Wasson, J. H., Haytville.
Wells, Frank, Lansing.
Wilson, Wm. B., Muskegon.
White, L. T., Eaton RapidsWright, Chas., Detroit.

Y.

Yeomans, E. T., Ionia.

HONORARY MEMBERS.

H. LeCaron, Braidwood, Ill. G. P. Engelhard, Chicago.

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Formulas on the labels and in the appendix to our price-list for all the liquid preparations of the Pharmacopeia, which can be made from medicinal extracts.

We publish only officinal formulas, taking for granted the fact that physicians are competent to make unofficinal formulas, and prefer so to do.

We invite particular attention to the following fluid extracts.

Fluid Extract Cherry Bark.—Proctor's Formula,

This extract possesses, in a marked degree, the true Cherry flavor, and being preserved with sugar, is freely miscible with water, ayrup or alcohol.

Fluid Extract Coffee.

Prepared from Java Coffee, and soluble in water, syrup or alcohol.

Fluid Extract Ginger Soluble.

For making Syrup Ginger. This extract is double the strength of Tincture Ginger, U. S. P., and is freely miscible with syrup.

Fluid Extract Golden Seal.—Without Alcohol.

This fluid extract is free from alcohol, and readily assimilates with water or glycerin. Each fluid ounce represents one troy ounce of Golden Seal Root.

Fluid Extract Ipecac Root.

Prepared according to the acetic acid formula U. S. P. 1860, freely soluble in syrup, water or alcohol

Fluid Extract Licorice Root.—For Quinine Mixtures.

This fluid extract is preserved without the use of alcohol, and will assimilate readily with water, glycerin, syrup or alcohol Syrup of Licorice of any desired strength may be in-tantly prepared by adding this fluid extract to simple syrup. The taste of Quinine can be effectually disguised by triturating with this fi. ext. in the proportion of 8 grains of the salt to 1 fluid dram fl. ext. and 7 drams simple syrup.

Fluid Extract Orange, Sweet, for Syrup.

Prepared from Select Peel, soluble in water and syrup, used in preparing Syrup Orange

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Formula like Syrup Stillingia Comp. Amer Ph. This extract will assimilate readily with syrup, water or alcohol.

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Formula like Syrup Sareaparilla Comp. (U. S. P.) Freely miscible with syrup, water or alcohol.

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Formula like Syrup Squill Comp. (U. S. P.), without the Tartar Emetic. Freely soluble in syrup, water or alcohol.

Fluid Extract Tolu Soluble.

For making Syrup Tolu. This extract is same strength as Tinct. Tolu, U. S. P., and is freely miscible with syrup.

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the proper time.

8d. Percolation under cold air pressure is now made use of through the whole mass of

3d. Percolation under cold air pressure is now made use of analysis.

Advantages obtained by this process are a full strength fluid extract, characteristic by its odor, taste and appearance of each particular drug operated on, all volatile principles thereby retained, and no heat whatever used, obviating the effects usually ascribed to this cause, decomposition, etc. All the operations going on in this process are out of contact of the open air and no evaporation or heating operation required.

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to be used.

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and attractive shelf packages.

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Other powders than those here quoted will be furnished, of guaranteed purity, upon application. Our desire is to have the trade order the following powders in 1 pound cans only, and on that account we have merely added the increased cost, figured down to the lowest hasia.

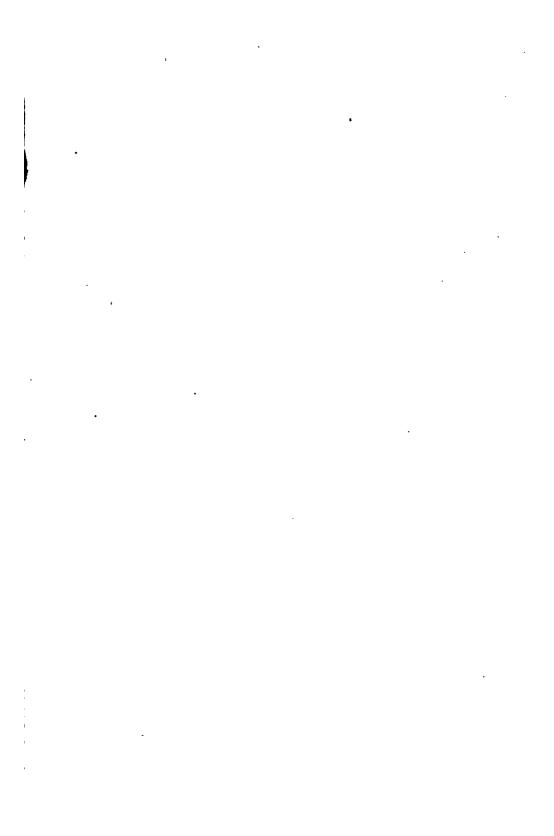
Specify McKesson & Robbins' Powders in Pound Cans.

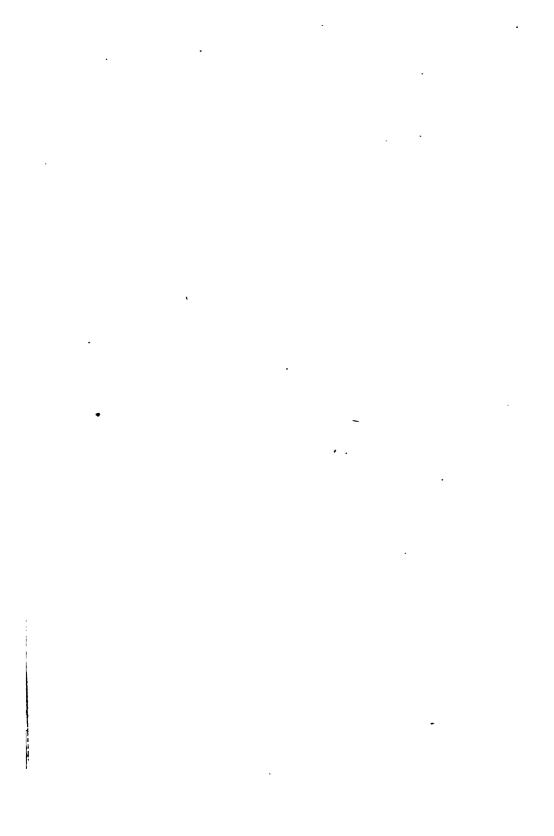
	LB.
Aromatic Powder	31.00
Bark, Cinchona, Bolivia, 3 per cent. total alkaloids	1.00
Bark, Cinchona, Calisaya, 6 per cent. total alkaloids, over 2 per cent. being quinine	2.00
Bark, Cinchona, Cuprea, 4 per cent. total alkaloids, over 2½ per cent. being quinine Bark, Cinchona, Red, true, 6 per cent. total alkaloids, over 2 per cent. being quinine	1.85
Bark, Cinchona, Red, true, 6 per cent. total alkaloids, over 2 per cent. being quinine	2.00
Bark Cinchona, Red. "R." 8 per cent. total alkaloida	1 10
Berries, Cubeb (coarse powdered)	85
Cantharides	1.80
Berries, Cubeb (coarse powdered). Cantharides Colocynth, Pulp (freed from seeds).	2.80
Dover's Powder, U. S. 1870 with Powdered Sulphate Potassa	1.25
Dover's Powder II. S. 1870, with Powdered Sugar of Milk	1 40
Dover's Powder, U. S. 1870, with Powdered Sugar of Milk	2.10
Extracta Licorica Calab true	50
Extracts, Licorice, Calab, true	0.50
Guarana	9 90
Gum Alone Rocatrina	65
Gum Aloes, Socotrine. We call special attention to our Purified Socotrine Aloes (not powdered), which we	w
confider a botter form for general rec	1 80
consider a better form for general use	1.50
dun, assignment, we do not saviso the powered form for this size of, as the next	
necessarily used in powdering the best grades affects the quality, while the grades which are easily powdered are deficient in strength. We advise the use of McKesson	
which are easily powdered are deficient in strength. We advise the use of McKesson	
	4 00
Can Out a series and the series of the serie	1.00
& Robbins' Purified Asafædita, price	1.00 6.00
" Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00
Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00 1.25
" Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00 1.25
Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00 1.25 .85
" Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00 1.25 .85 .85
" Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00 1.25 .85 .85 80 1.30
" Scammony, Virgin (assay on every label) at present testing 80 per cent. " Tragscanth Nutneg. Peassium, Chlorate, French Boot, Aconite, English " Ipecac, Brazil " Jalap.	1.00 6.00 11.00 1.25 .85 .85 80 1.30 40
" Scammony, Virgin (assay on every label) at present testing 80 per cent "Tragacanth. Nutmeg. Peassium, Chlorate, French. Root, Aconite, English. " Ipecac, Brazil. " Jalap. " Licorice, Russian	1.00 6.00 11.00 1.25 .85 .85 80 1.30 40
" Scammony, Virgin (assay on every label) at present testing 80 per cent	1.00 6.00 11.00 1.25 .85 .85 80 1.30 40 50
" Scammony, Virgin (assay on every label) at present testing 80 per cent. "Tragacanth Nutmeg. Petassium, Chlorate, French Root, Aconite, English " Ipecac, Brazil " Jalap. " Licorice, Russian " Rhubarb Seed, Curdamon.	1.00 6.00 11.00 1.25 .85 .85 80 1.30 40 50 1.60 2.60
" Scammony, Virgin (assay on every label) at present testing 80 per cent. "Tragacanth. Nutmeg. Petassium, Chiorate, French. Root, Aconite, English. " Ipecac, Brazil. " Jalap. " Licorice, Russian. " Rhubarb. Seed, Curdamon. " Colchicum, English.	1.00 6.00 11.00 1.25 .85 .85 80 1.30 40 50 1.60 2.60
" Scammony, Virgin (assay on every label) at present testing 80 per cent. " Tragacanth Nutneg Petassium, Chlorate, French Root, Aconite, English " Ipecac, Brazil " Jalap " Licorice, Russian " Ehubarb Seed, Curdamon " Colchicum, English " Lobelia	1.00 6.00 11.00 1.25 .85 .80 1.30 40 50 1.60 2.60 1.00
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" Scammony, Virgin (assay on every label) at present testing 80 per cent. " Tragacanth Nutmeg. Peassium, Chlorate, French Root, Aconite, English " Ipecac, Brazil. " Jalap " Licorice, Russian " Rhubarb Seed, Curdamon. " Colchicum, English. " Lobella. Soap, White Castile	1.00 6.00 11.00 1.25 .85 .85 80 1.30 50 1.60 2.60 80 1.00
" Scammony, Virgin (assay on every label) at present testing 80 per cent. " Tragacanth. Nutmeg. Peassium, Chiorate, French. Root, Aconite, English. " Ipecac, Brazil. " Jalap. " Licorice, Russian. " Rhubarb. Seed, Curdamon. " Colchicum, English. " Lobelia. Soap, White Castile. Sugar of Milk.	1.00 6.00 11.00 1.25 .85 .85 80 1.30 50 1.60 2.60 80 1.00 40
" Scammony, Virgin (assay on every label) at present testing 80 per cent. " Tragacanth Nutmeg. Peassium, Chlorate, French Root, Aconite, English " Ipecac, Brazil. " Jalap " Licorice, Russian " Rhubarb Seed, Curdamon. " Colchicum, English. " Lobella. Soap, White Castile	1.00 6.00 11.00 1.25 .85 .80 1.30 40 1.60 80 1.00 40 Red.

per cent. total alkaloids. The Cinchona Calisaya and Cinchona Red, true above quoted, contain, besides other alkaloids, over 2 per cent. Quinine, and meet the requirements of the Pharmacopoeda for "Cinchona Flava," and "Cinchona Rubra."

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OF THE

SECOND ANNUAL MEETING

-OF THE-

MICHIGAN STATE

Pharmaceutical Association

HELD AT DETROIT

September 9, 10 and 11, 1884.

MUSKEGON, MICH., CHRONICLE BOOK AND JOB PRESSES 1885.

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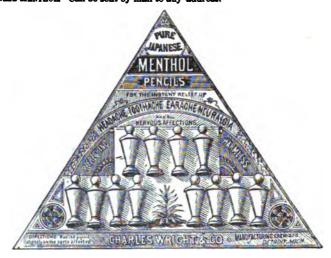
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ilphate,"

Page 120, 30th line from top, read "unicorn false (helonius dioica)" instead or 'unicorn, false belonius dioica."

Page 126, 18th line, omit "at once" after "did not."

" " 28th " read No. 7 instead of No. 6.
" 127, 5th " " ".4 C. C." instead of "4 C. C."
" " 6th " " ".8 C. C." instead of "8 C. C."

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1884--5.

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JAMES VERNOR, -			-		-		-	- Detroit.
O. Eberbach,	-			•		•		- Ann Arbor.
DELEGATES T			E N. ASS				'AI	L DRUG-
ARTHUR BASSETT,	-			-				Detroit.
J. H. KELLOGG, -			-		-		-	East Saginaw.
Jacob Jesson, -	-			-		-		- Muskegon.
F. W. R. PERRY, -			÷		_			- Detroit.
ISAAC WATTS,	-			-		-		Grand Rapids.
		AL	TER	NAT	Es.			
John B. Watson,		_		-		-		Coopersville.
C. G. STONE,			-			-		- Detroit.
C. A. Fellows,				-			-	Big Rapids.
BURR D. NORTHRUP						_		- Lansing.
H. J. HARVEY,	,			_			_	- Detroit.
#1. J. 11281(12.15)								

Preface.

Pursuant to a call from Mr. G. W. Crouter, Chairman of the Executive Committee, to the officers of the Association, a meeting was held on June 10th, in the parlors of the Michigan Exchange, which was attended by Frank Wells, Lansing; Isaac Watts, Grand Rapids; George McDonald, Kalamazoo; H. J. Brown and A. B. Prescott, Ann Arbor; O. P. Safford, Flint; F. M. Alsdorf, Lansing; A. W. Allen, A. B. Stevens, Wm. Dupont, Detroit; and Jacob Jesson, Muskegon. The meeting was for the purpose of arranging a programme for the second annual meeting, and resulted in adopting the following *Call* and *Programme*:

CALL.

The Second Annual Meeting will convene in Merrill Hall, corner of Woodward and Jefferson avenues, Detroit, Mich., on Tuesday, Sept. 9th, at 2 o'clock p. m.

A very large attendance is anticipated. Your personal co-operation is desired; interest your neighbors and clerks in this announcement, let all attend and the occasion thus be made a pronounced success, professionally, commercially and socially.

An especial invitation is extended to the wives of members to accompany their husbands on this occasion.

The commercial exhibits by the leading wholesale druggists and manufacturers of the country will alone repay any druggist for coming to Detroit.

The professional part of the programme promises to be very interesting. A large number of papers on interesting subjects will be read and discussed.

Trade interests will not be forgotten but will receive proper attention.

The social part of the programme is tendered to the Associa-

tion by the wholesale and retail druggists of Detroit, and will consist of an excursion on the river on Wednesday afternoon, together with a visit by invitation to Park, Davis & Co.'s Laboratory and a banquet on Wednesday evening.

A rate of one and one-third fare for the round trip has been obtained over the Detroit, Grand Haven & Milwaukee; Lake Shore & Michigan Southern; Flint & Pere Marquette; Michigan Central; Detroit, Lansing & Northern; Saginaw Valley & St. Louis; Grand Rapids & Indiana; Chicago & Grand Trunk Railroads. To obtain reduced rates it is in all cases necessary to send request for certificate, stating road preferred, to the Secretary, not later than September 1st.

Reduced rates have been obtained for members and their families at the following hotels:

 MICHIGAN EXCHANGE,
 \$2.00 per day.

 BRUNSWICK,
 \$2.00 to \$2.50 per day.

 STANDISH
 \$1.50 per day.

Enclosed with this announcement you will find an application blank, which, should you feel kindly toward the Association and its objects, please fill out and return to the Secretary not later than September 1st.

PROGRAMME.

TUESDAY AFTERNOON-2 P.M.

FIRST SESSION.

Meeting called to order by President Wells.

Roll call.

Address of welcome, by his honor Judge Chipman, of Detroit.

Response in behalf of the Association, by A. B. Prescott, of Ann Arbor.

Reading of minutes of last meeting.

President's address.

Presentation of names for membership.

TUESDAY EVENING-7:30 P.M.

SECOND SESSION.

Report of Executive Committee on applications for membership Election of members.

Reports of committees and reading of papers.

WEDNESDAY MORNING-9.1. M.

THIRD SESSION.

Unfinished business.

Reading of papers and discussion of same continued.

Trade Interests.

WEDNESDAY AFTERNOON-2 P. M.

An excursion on the river by invitation of the Detroit druggists, together with a visit, by invitation of Parke, Davis & Co., to their Laboratory.

WEDNESDAY EVENING-7:30 P. M.

FOURTH SESSION.

Trade Interests—continued.

Banquet at 9 o'clock, given by the Detroit druggists.

THURSDAY MORNING-9 A. M.

FIFTH SESSION.

Election of officers.

Appointing of committees.

Miscellaneous and unfinished business.

"Home, Sweet Home."

The Second Annual meeting of the Michigan State Pharmaceutical Association convened in Merril IHall, Detroit, September 9th, 10th and 11th, with an attendance of two hundred and fifty members, and was probably the largest gathering of Pharmacists called together this year.

A great deal of important business was transacted, the most important of which was the adoption of a Pharmacy Bill, to be presented to the Legislature at the next session. The Bill as adopted, if it becomes a law, will be an improvement on nearly all pharmacy law in existence. The committee on Legislation of

the Illinois Pharmaceutical Association in their report have this to say in regard to the Michigan Pharmacy Bill:

This Bill embodies every Feature which experience in this and other states has proven to be of value, and if enacted its influence would unquestionably promote the incorporation of its merits in the legislation of other states.

The grand success of this meeting was due largely to the efficiency of the officers and committees, who deserve a good deal of credit for the manner in which they looked after the interests of the Association, regardless of cost or inconvenience to themselves; also to the Detroit Pharmaceutical Association, and the untiring efforts of the local secretary.

In commenting on this meeting the *Druggist* says:

"The meeting at Lansing was a success, and though it promised well for future meetings, none but an extravagant enthusiast would have dared to predict that the membership would bound at the next meeting from a total of a little over one hundred to a total of nearly five hundred. What would have been a rash prediction has become a strong, solid reality. Over three hundred new members admitted at Detroit and probably as large an attendance as convened at the national convention in Milwaukee a few weeks since. These are inspiring facts, and prove that the druggists of Michigan are awake to the necessity of promoting their business and professional interests, and appreciate the means whereby these objects can most certainly and expeditiously be attained.

The number of papers read was, for a State meeting, very unusual, in quality; it is no disparagement to the A. P. A. to say that they will, in general, compare very favorably with the average, and some not unfavorably with the best presented at the Milwaukee meeting. The success of this feature of the meeting was unquestionably due in considerable measure to the skill, labor and devotion of the chairman of the Committee on Queries, but the work accomplished demonstrated that Michigan is entitled to a front rank in the character and number of her scientific pharmacists, and that the Association may be relied upon to add its full contingent to the literature and development of pharmacy."

The Detroit Post: "It would be no easy task to find 500 men

associated for a purpose and engaged in the same line of trade who possess more intelligence or are more businesslike in appearance than are the members of the State Pharmaceutical Association. Their discussions were always cool, deliberate, well timed and to the point. The best of feeling always prevailed, and on the whole the Association deserves the encouragement of the public and the State."

The social part of the programme was in charge of the Detroit Pharmaceutical Association, and the hospitality of the citizens of Detroit will long be remembered by the visiting members.

On Tuesday evening a conversazione was tendered the members at the residence of Mr. Frederick Stearns, and also a reception at the residence of Chas. Wright, both of which were largely attended and enjoyed.

Wednesday afternoon was given up to an excursion on the river, which was participated in by the members and their ladies and representatives of the jobbing and manufacturing drug trade of Detroit.

Promptly at 2:15 o'clock the excursion steamer Garland cast off her moorings and started on her trip up the river with 325 delighted passengers on board. The Great Western band of Detroit furnished the music. After an enjoyable ride of two hours the steamer brought up at the landing of the Detroit boat club, directly in front of the extensive laboratory of Parke, Davis & Co. On alighting the excursionists were courteously received by the members of the firm and at once conducted through the immense establishment. An hour thus spent brought the tired and heated sight-seers into the printing and binding department, where a repast consisting of sandwiches, cake and fruit was served. Shortly after five o'clock the signal for departing was given and after another ride of an hour into Lake St. Clair the boat landed at the foot of Woodward avenue.

Wednesday evening at 10 o'clock the members and their friends repaired to the Michigan Exchange, where the druggists of Detroit tendered the Association a complimentary banquet. The menu was of the most fashionable, and could not well be surpassed in excellence, while the large dining-room was filled to its utmost capacity with guests. The repast over, Dr. J. J. Mulheron, as toast-master, started the "flow of souls" by introducing the sentiment, "The State Pharmaceutical Association," to which ex-President Wells responded very happily. Mr. A. B. Stevens had a glowing tribute to "Local Pharmaceutical Associations"; the preeminent attractions of "The City of Detroit" were, amid much applause, graphically portrayed by Mr. Frederick Stearns; the "N. R. D. A." was made conspicuous by the business-like commendations of John J. Dodds; the grandeur and renown of the "University of Michigan" was the subject of a very excellent speech by A. S. Parker of Detroit, "The Pharmaceutical Press," by G. P. Engelhard of the Chicago Druggist, was unrewarded by bouquets, contrary to contract; the "Retail Drug Trade" was a thing of wealth and beauty in the hands of A. Bassett, of Detroit; the sentiment, "The Ladies," by S. E. Parkill, of Owosso, was so delicately, critically, emotionally and yearningly treated by the "Young Man Eloquent," that no further evidence was required to indicate his deep interest in the fair subject assigned him.

JACOB JESSON, Secretary.

Muskegon Mich., Nov. 1st, 1884.

Members in Attendance

AT THE SECOND ANNUAL MEETING.

C

Alsdorf, F. M., Lansing. Allen, A. W., Detroit.

Baldwin, E. L., Tallman. Barbour, F. S., Clifford. Beachum, C. B., Romeo. Bassett E. C., South Lyon. Banks, A. W., Detroit. Bower, Manley, Clarkston. Brown, J. J., Okemes. Brown, H. J., Ann Arbor. Buchanan, B. F., Harrisville. Babington, John, Corunna. Blackmer, H. A., Charlotte.

Champney, A. R., Detroit. Chamberlain, M., Horton. Coe, T. D., Romeo. Covert, C. Fred, Paw Paw. Chamberlain, G. T., Hartford. Caldwell, J. W., Detroit. Cahalan, John C., Wyandotte. Colman, H. G., Kalamazoo.

Dupont, Wm., Detroit. Davis, James E., "Dodds, John J., "Dodds, Wm. B., "

Eberbach, O., Ann Arbor.

Frank, H. A. Detroit. Fellows, C. A., Big Rapids. A Anderson, E., Midland. Adams, C. H., Otsego. B

Beebe, H. P., Eaton Rapids. Bristol, U. D., Lapeor. Bristol, F. E., Lapeer. Bullard, E. A., Vassar. Brown, I. V., Galesburg. Burroughs, C. S., Clinton. Bassett, Arthur, Detroit. Bertram, J. P., Westphalia. Baier, C. G., Detroit. Burwell, R. G., Ft Gratiot. Bigg, A. H. Detroit.

Crouter, G. W., Charlevoix. Calkins, H. W., Detroit. Clark, J. K., Blissfield. Cuttler, W. R., Ionia. Clark, W. O., Middleville. Crowley, J. J., Detroit. Cooper, D. M. "

D
Damon, J. A., Millington.
Dahm, A. C., Mt. Clemens.
Deitz, John A., Cadillac.
Dimick, S. H., Ypsilanti.
E

Fulton, Robert, Detroit. Fournier, L., Farrand, J. E., Detroit. Fincher, F. W., Pentwater. Francis, J. L., Ypsilanti.

Goodsell, H. A., Jasper. Grunow, A. H., Detroit. Garrigues, S. S., Ann Arbor. Gundrum, Geo., Ionia. Gerow, J. E., McBrides. Gladding, B. O., Constantine.

Hartz, H., Detroit. Hall, J. W., Hudson. Hogeboom, J. G., Saginaw. Hawkins, Henry, Detroit. Harvey, H. D., Bangor. Hale, H. G., Nashville. Hipkins, L. S., Blanchard. Hendrick, F. H., Edmore. Hullinger, Jas., Big Rapids. Hewitt, J. S., Milford. Hurd, John E., Detroit. Hicks, W. H., Morley. Hurd, A. E., Davison Station.

Inglis, Frank, Detroit.

Jones, E. L., Joslen, O. C., St. Johns. Jesson, Jacob, Muskegon. Judson, F. E., Brighton.

Kellogg, J. H., East Saginaw. Kephart, Henry, Berrien Springs Kennedy, E. J., Traverse City. Kephart, Walter, Berrien Springs Kotcher, C. W., Detroit. Kenyon, Wm. H., Howell.

Lambert B. F., Detroit. Lane, I. D., Sand Beach. Lymon, A. H., Manistee. Frizelle, S. F., Frizelle, C. S., Fink, L. B.,

G Gleason, E. J., Richmond. Green, A. L., Ann Arbor. Griffith, W. F., Howell. Goodyear, J. J., Ann Arbor. Gregory, A. W. C., Albion.

H

Hedges, H. C., Lansing. Houp, F., Detroit. Harrison, H. E., Richmond. Harrison, D. A., Kalamazoo. Harvey, S., Detroit. Hibbard, Frank, Evart. Hutchings, Wm., Leslie. Hall, W. A., Greenville. Hanlon, A., Middleville. Hogguer, F. F. W., Detroit. Hawkins, Henry, " Hallock, D. S.,

J Johnson, Otis, Ann Arbor. Johnston, Wm., Detroit. Johnson, Jas., Traverse City. Johnston, Wm. S., Detroit.

Ι

Kendrick, E. H., Millbrook. Kinmont, B., Vandalia. Kemink, Theo., Grand Rapids.

Lacy, ---, Sault St. Marie. Lee, A. B., Detroit. Laubengayer, J. F., Owosso. Longwell, E. B., Paw Paw. Lyon, A. B., Detroit.

Morford, A. D., Ypsilanti.
Miles, John B., Dexter.
Millikin, T. J., St. Clair.
Merrell, F. P., Hartford.
Mueller, J. C., Detroit.
Madill, Thos., East Saginaw.
McKenna, J. D., Meredith.
Myers, A. W., Gobleville.
Miller, C. N., Dryden.
Myers, John, Mt. Clemens.
McDonald, Geo., Kalamazoo.

Nowel, W. S., Laingsburg. Northrup, Burr D., Lansing. Newell, C. P., Flushing.

Orr, John J.; Tecumseh.

Perry, F. W. R., Detroit.
Parkill, S. E., Owosso.
Parkill, C. P.,
Pegg, H. D., Morenci.
Platts, R., Pt. Sanilac.
Parker, G. T., Port Huron.
Pratt, George, Detroit.
Perry, D. B., West Bay City.
Prescott, A. B., Ann Arbor.

Raider, J. F. A., Newaygo. Roche, W. J., Meredith. Reidy, Mike, Corunna. Roussin, V., Ludington. Reasner, F. M., Jackson. Ringler, E., Saginaw.

Stearns, Fred, Detroit. Sprague, C. M., Fair Grove. Saekett, S. M., Monroe. Smith, C. M., Clarkston. Leuschner, R., Detroit.

M

Middleton, V. H., Grand Rapids.
Martin, Henry, Jackson.
Moore, John, Ann Arbor.
Mann, Albert, "
Mason, G. B., Saline.
McFarland, A., Detroit.
McFarland, W., "
Martin, A. F., Imlay City.
McDonald, David, Kalamazoo.
Mackimmic, J. A., Detroit.

N Neff, H. C., Detroit. Nelson, E. H., "

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P

Pinkerton, R. J., Bancroft. Phelps, L. E., Flint. Peacock, C. M., Corunna. Phillips, E. F., Armada. Pinkney, C. A., Plymouth. Price, O. J., Detroit Parker, A. S., "Petrie, J. D., Porter, W. B., "

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Reynolds, W. B., Eaton Rapids. Ross, E. W., Detroit. Royer, Jr., T., Ann Arbor. Richards, T. H., Detroit. Ripley, L. G., Montague. Ronnefeld, Theo., Detroit.

S

Spencer, M. Ella, Linden. Schlieper, F. A., Bay City. Sorg, H. A., Kalamazoo. Schumaker, A. B., Grand Ledge. Spencer, J. L., Linden. Sprague, W. G., Flushing. Safford, O. P., Flint. Smith, Fletcher, Saginaw. Snow, S. M., Ludington. Stone, C. G., Detroit. Saltzer, A. B., Detroit.

Taylor, E. J., Vassar. Tubbs, Cyrus C., Cheasing. Taylor, J. A., Detroit.

Vanden Belt N., Detroit. Vincent, J. T., Lapeer. Vandecar, J. H., North Branch.

Weis, H. L., Detroit.
Williams, W. C., Detroit.
Ward, G. J., St. Clair.
Watson, J. B. Coopersville.
Wright, C. A., Teeumseh.
Wilson, W. A., St. Johns.
Wilson, W. B., Muskegon.
Wrampelmeir, T. J., Ann Arbor.
Wright, Chas., Detroit.
Waples, Grafton, "
Williamson, J., "
Warner, W. A., "

Young, C. A., Battle Creek.

Soule, C. A., Detroit. Smith, A. B., Trenton. Smith, F. D., Detroit. Shaw, Bowman C., Clare. Stevens, A. B., Detroit. Stringer, G. W., Detroit.

T Trowbridge, Theo., Decatur. Tobey, N. I., Evart. Teetzel, Wm. H., Detroit.

Vernor, James, Detroit. Varnum, E. C., Jonesville.

Wells, Frank, Lansing.
Watts, Isaac, Grand Rapids.
Whelpley, B. I., Hoytville.
Wheeler, C. F., Hubbardston.
Wurzburg, F. J., Grand Rapids.
Woolsey, F. F., Hartford.
Waite, G. W., Coldwater.
White, W. L., Grand Rapids.
Watz, H. G., Saginaw.
Webber, A. H., Big Rapids.
Wasson. J. H., Hoytville.

Z.

SECOND ANNUAL MEETING

-OF THE-

Michigan State

Pharmaceutical Association,

HELD IN MERRLLL HALL IN THE CITY OF DETROIT,

On the 9th, 10th and 11th of September, 1884.

REPORTED STENOGRAPHICALLY BY HERSCHEL WHITAKER, DETROIT, MICHIGAN.

The hour of meeting having arrived, the Association was called to order by the president, Mr. Frank Wells of Lansing, Mich., who said:

Gentlemen of the Association: Meeting you all most cordially to-day, I congratulate you on the many favorable circumstances that surround us at this second meeting of our association. Numerous friends with cordial smiles gladden our hearts by their presence. We meet here in the early glow of an Autumn—rather an ardent one—which is crowning with unusual abundance the labors of the husbandman, and with improved business prospects which are closing a year of unusual depression. The warm, very warm welcome that is given us by our Detroit friends,

together with the life and health that have been granted to us all, cannot but fill our hearts with thankfulness.

I further congratulate you that the seed sown in Lansing during those chilly days last November fell not among stones, nor was it choked with thorns, but it fell upon good ground and bids fair to bring forth an hundred fold. As we behold the harvest ripening, we gather here to-day from the pine woods of the North and the fertile plains and valleys of the South, and from the wave-washed shores of the East and the West. They who sowed the seed in no selfish spirit most cordially welcome the new workers, and gladly assure them that in the share that may fall to each, some to wield the sickle, some to bind the grain and others to glean; that all will be animated in their noble work of emulation to see who can garner the most sheaves for the public good.

Our exercises will commence with prayer by the Rev. Rufus W. Clark.

Prayer by Rev. Rufus W. Clark.

THE PRESIDENT: In the absence of Mayor Grummond of Detroit who was to extend to us a welcome on behalf of the City of Detroit, Judge Chipman has kindly consented to take his place. Gentlemen, I take great pleasure in presenting Judge Chipman, of Detroit.

Judge J. Logan Chipman was cordially received by the association and spoke as follows:

Mr. President and gentlemen of the convention: I regret very much that the chief magistrate of the city, Mayor Grummond, is not here to-day to extend to you on behalf of the city of Detroit a welcome. I have been asked to take his place, and while perhaps I may not do it as gracefully or as graciously as he would have done it, still that same old generous Michigan hospitality is in my heart that is in his, the same that is in your hearts and I bid you welcome in behalf of the city of Detroit.

This is an important occasion in the history of Detroit. You gentlemen represent a great interest, you perform a great function, your duties to society are of the very gravest nature; duties requiring education, professional ability and great fidelity. Of course I do not mean to say to you, and if I did you would not believe me, that I love everything you sell, neither in the utmost en-

thusiasm would I be betrayed into saying that I like a great many things you sell, and yet, my friends, I recognize the fact that an association of this kind is an agency of the utmost concern. Its uses can hardly be exaggerated. It means every thing. It means accuracy, it means fidelity in the very places where intelligence, accuracy and fidelity are most likely to benefit the human race; therefore we feel glad that you have selected the city of Detroit as the scene of your labors upon the present occasion, and I say to you now, welcome, thrice welcome. Come often, stay long-if we could keep you all here, if we had room for you, we would never let you go; come again, Detroit welcomes you. Detroit welcomes every man from this state of two peninsulas. We are proud of our city. We hope you love it as we love it; but of this be assured my friends, that Detroit welcomes you, emphatically welcomes you, receives you during your labors here now as children of her own. Welcome. (Applause.)

Prof. Prescott on behalf of the association responded as follows:

This most hospitable welcome, given by your Honor in the name of the city of Detroit, is received by the Michigan State Pharmaceutical Association most gladly, most thankfully. thank the good city of Detroit for this kind and generous welcome of which we have received so many tokens so characteristic of her, and we thank your Honor for the suggestive and helpful words in which this welcome has been extended. Coming as we do from all parts of Michigan, from the counties round about the circle of the lakes and from the counties of the interior, coming as citizens of Michigan, we are proud of the city of Detroit and glad to have our meeting here. We take pride in the wealth, in the substantial character and the beauty and desirability of this our chief city. Then, it is fitting that we as pharmacists should meet as often as we may here, among these great storehouses of pharmaceutical material, material gathered from all parts of the globe with the greatest earnestness and enterprise; material manufactured with highest skill and under the impetus of commercial activity. It is well we should meet here. And then, too, we meet for earnest purposes as well as for relaxation and annual communication, and we are glad to meet in a pleasant place to have a holiday or a half holiday. And we have to-day, as has been said, a welcome almost too warm to be agreeable in all particulars, but we have been hearing through the newspapers and others of a cold wave that is coming from some place, from Manitoba or somewhere else down this way, and we thought if we found it anywhere it would be on the shores of the Detroit river, and we do hope we may find it before we leave here.

We hope we may behave ourselves so well as to deserve the earnestness and candor of this welcome and all that may go with it. We have some work to do. The business of the pharmacist is one of great responsibility, and the better to qualify ourselves for that responsibility for that work we are here. It is that we may faithfully and earnestly perform our services in every community as pharmacists, that this association and like associations have been organized and are being strengthened. own work to do at this meeting. We desire to keep step with the organizations of the city and state and of the country and of the world; the organizations whereby pharmacy is cultivated. Pharmacy is a distinct profession and as such, and as a responsible profession, it needs to cultivate its own advancement by methods which must necessarily be mainly its own. We learn by experience and we gather experience to experience by comparing the practice of the one with the practice of the other, and by building up in this way a literature. The literature of pharmacy is rich and old, and we trust by the work of this association to add something to the richness of this literature. Some of us are here to report researches, the result of experience in a modest way, and yet it is by little and little that professional learning and the sciences are built up. Under the liberty of free institutions to come together and work in our own way, we convene very gladly, and we meet joyously and gladly this welcome extended to us. We hope to make new acquaintances with each other, we hope to ripen old acquaintance by eating salt together, by uniting possibly in commercial work, in the establishment of just methods of commerce and in more scientific and exactly apportioning our work, and we will interpret these kind and helpful words which have been spoken to us at this time as good omens of the kindly care of the public as represented by popular sentiment and as represented in civil power, the kindly care of the state over the profession and the pursuit of pharmacy as an important interest. We hope at all events to deserve such kindly care, such favorable regard. The strength of any profession we are assured lies in the fidelity and the ability and skill with which its service is best administered in the community. It requires but a few words to answer this welcome. The proceedings of the meeting will be we hope the answer, and I will no longer delay you. (Applause.)

The roll of membership was then called by the Secretary, and about seventy members found to be present.

After the calling of the roll of membership, the President delivered his annual address as follows:

GENTLEMEN OF THE MICHIGAN STATE PHARMACEUTICAL Association: We interrupt to-day the circuit of business lives and duties, that we may meet, for the second time, in our corporate existence, to promote the objects which called our association into being. Those objects are, "to unite the reputable pharmacists of this State, to improve the science and art of pharmacy, to elevate its standard, to restrict its practice to properly qualified pharmacists, and to promote the business interests of its members." These purposes are all worthy of, and should secure, our most earnest efforts. The steps already taken are extremely promising, and the full fruition of our wishes depends solely upon united effort. The power of concerted action, to accomplish a good purpose, has been demonstrated by centuries of human experience. Records of trade organizations are almost coeval with the records of our race. Their instrumentality has been most potent in developing and promoting the interests of science, art and commerce since the time those interests began to exist. Associations of merchants and artisans were a prominent feature of Roman life, and protected and fostered by Roman law, they increased in importance until the fall of the republic. From Rome they spread over the entire continent of Europe, where, under the name of guilds, their influence became extremely powerful, even before the tenth century. Possessing in an eminent degree a spirit of faithfulness, honor, and fraternity, their members were bound by voluntary obligations to guard each other's rights, against the oppression and tyranny incident to a lawless age. They were the

pioneers of civilization at the time when western Europe was emerging from barbarism. For over two hundred years, during that period of gloom known as the Dark Ages, these guilds, in the midst of ignorance, superstition and vice, were the possessors of the skill and much of the knowledge of their age, and they guarded well the treasures. The oppressors of the weak, the lords and barons, found their chief opposition and rivals in these societies. Long and often bloody was the conflict between the guilds upon one side,—fighting for their existence, and to keep aglow the sparks of knowledge and skill, which cost so much to light—and the arrogant nobles upon the other, many of whom regarded honest toil, education and business habits with the same feeling of scorn they did morality and virtue. Organization, with fixed and honest purpose, finally triumphed, and through that triumph were laid the foundations of social order, true scientific progress, proper business relations, and the principles of liberty and justice, which have developed constitutional governments and those systems of liberal and popular education we now enjoy.

It is thus shown that the history of associations, composed of persons engaged in the same business, occupation or trade, is largely the history of our civilization. As the causes which called the guilds into existence diminished, and intelligence, skill and business enterprise obtained legal protection and a general recognition of their value, these societies ceased to occupy the prominent position they had held for centuries, and one after another disappeared. Their revival in later times, in the form of professional and business associations, indicates either that some unrecognized causes, which made them valuable in a former age, still exist, or that others, incident to the more complex social and business relations of the present time, have been developed. descendants of the ancient guilds, the modern associations, differ in objects and aims from their progenitors in little save the characteristics incident to changed conditions of society and customs. latter, like the former, seek to bar from their ranks the incompetent and to protect themselves from the unscrupulous. They believe that well defined rights, privileges and standards of ability are no less important in the various pursuits of life now than formerly, and by organizing, they act upon the knowledge taught by both experience and reason, that these objects can only be acquired and held by the constant efforts of united workers. Pharmacy looks to a union of its members to-day as a relief from many increasing evils, and as a promising agent for the elevation of its character and work.

Unnoticed causes have long been in operation to produce a crisis in some of the conditions of pharmacy. Heat gradually applied to water produces for a long time no visible effect, but suddenly, without special increase of temperature, ebullition ensues, and the previously quiet mass is in a state of commotion, with evidences of extraordinary power. The potential forces inherent in our profession have been steadily, but imperceptibly, reaching a kenetic condition and are to-day, all over the land, in a state of violent agitation, exhibiting unmistakable manifestations of energy. This energy, by transmutation into organization, has already produced associations in over twenty states. Michigan, though not the first to show evidences of these forces, is by no means least in her exhibition of their strength. Like her sister states, her pharmacists have long felt a need for legislation that would restrict the practice of the profession to those properly qualified, and this, perhaps, was the finally potent cause which excited them to action and rendered our first meeting so successful, striction has not been sought for in other states, nor is it in ours, for the benefit of druggists alone. In fact its aid is invoked chiefly for the safety of the public, to whom it will secure a large measure of protection from the mistakes of the ignorant or pretended pharmacist. Were the fact less familiar, it would be a matter of surprise, that a state which has done so much to encourage education by means of its magnificent common school system, its richly endowed University and Agricultural College, still permits the lives of its citizens to be imperilled by ignorance. Justice demands for their protection a standard of qualification, as well for those who practice pharmacy, as for those who practice law. The importance of such a standard is even greater in the former than in the latter profession, for the unqualified attorney can only deprive you of property, and perhaps liberty, both of which may be regained, while the ignorant pharmacist takes from you the life or health, which can never be restored. No argument would

be deemed necessary to convince intelligent minds of the importance of restricting the preparation and sale of powerful drugs and poisons to competent hands, had not so much difficulty and many failures been experienced in obtaining legislation for this purpose, in many of the states. It is, however, encouraging to us to know that the obstacles are diminishing, and the failures becoming less numerous. Each year brings welcome tidings of the success of state associations in obtaining by persistent effort and intelligent representation of their wants, such statutes as they desire. The present year has been signalized by the passage of excellent pharmacy laws in the states of New York and Ohio. Have we not reason to hope that before the close of another year, Michigan will be in this, as she is in nearly every other social, and educational position, fully abreast of the most intelligent thought of the age?

The pharmacy bill presented for your consideration, and published in the proceedings of our first meeting, should be thoroughly discussed in the light of our present knowledge, its provisions perfected, and all possible measures adopted to secure its passage at the next session of the legislature. Steps should also be taken for procuring a legal standing for our association by means of incorporation under the general law of this state. In addition to other advantages, this will entitle us to a delegate in the association for the revision of the pharmacopæa. I therefore recommend that the necessary authority be delegated to some of the officers of our association for this purpose.

TRADE INTERESTS.

Subjects of trade interest which affect our business and profits, though always of great importance, are receiving from druggists today more consideration than ever before. For many years we have been attracting to ourselves, and have become the dispensers of various classes of goods besides those legitimately belonging to pharmacy. While for some of these we merely claim preemption rights, there are others which, from their nature, clearly belong to the drug trade. These latter include patent medicines and the various articles indefinitely described as druggists sundries. It is estimated that not less than two-thirds of our profits are derived

from the sale of these goods. Within a few years our title to a large portion of this domain has been contested by other trades, while at the same time members of our own profession have endeavored, in a selfish spirit, and by unbusinesslike ways, to deprive us of the chief portion of its income. The contest between druggists and other dealers for the sale of perfumery, toilet goods and similar articles, will perhaps result in both continuing such sale. Some manufacturers are likely to make it to the interest of ourselves, and others to the interest of our competitors, to sell their products. A better knowledge of this class of merchandise, a disposition to keep only such as they have reason to believe are the best of their kinds, and their taste in exhibiting them, will always give druggists advantages over their rivals.

CUTTING OF PRICES.

The cutting of prices, especially of patent medicines, has become an evil of a very serious nature, and one which is confined to no locality. It has given rise to much discussion, and to the consideration of many plans for its suppression. The propriety of pharmacists selling this class of goods has been seriously questioned, and probably all the best dealers in our land would welcome the day when their own laboratories would furnish the medicines they might be called upon to dispense, a day when they might, without serious loss, discard forever the venerable sarsaparilla compound, the omnipotent liver pad, the mixtures expressed in chemical symbols, like S T 1860 X, the numerous pills, powders and plasters miraculously charged with magnetism, or claiming to be storage batteries of electricity, and the wonderful vegetable curatives which owe their origin to those distinguished men of science, the North American Indians. But the tree is deeply rooted, and we have so long eaten of its fruits, and been protected by its branches, that we shall hesitate to destroy it. The sale of patent medicines has grown to enormous dimensions and has become thoroughly identified with the drug trade. There are many plain and valid reasons why pharmacists alone should be entrusted with the dispensing of medicinal compounds of every kind, and it is from them that the public, unless unduly influenced in other directions, expect to obtain their supplies. Manufacturers keenly alive to their own interest seek for the services of no other class to furnish their cures and renovators, after the departure of the street musician and fishing jack. These strong bonds of mutual benefit and dependence therefore unite so firmly the business of the pharmacist proper and the dealer in patent medicines that the present generation is unlikely to witness their divorce.

In claiming a protection from manufacturers, which shall render the sale of their goods profitable, the retail dealer demands no more than he is rightfully entitled to, nor than such manufacturers have the ability to grant.

It is a protection they have already yielded to the jobber, through the rebate system. Economic principles which govern the prices of ordinary merchandises do not obviously apply to proprietary goods. Manufacturers of patent medicines fix arbitrarily a price for their preparations by the single package and by the dozen or gross. Under the rebate jobbers deviating from established wholesale prices have their supplies cut off by the proprietors. Can there be any valid reason why retailers should not be equally compelled to adhere to the price established for them? In addition to the protection this system has afforded the wholesale trade, it has increased the price of nearly every article to retailers who purchase in ordinary quantities, while it furnishes large lots at prices which enable those who desire to retail at regular jobbing prices with a fair profit. Such discrimination against legitimate retailers is manifestly unjust. We have the power, and self preservation dictates its exercise, to compel from proprietors protection for ourselves, equally with the jobbers. This power is united action on the part of pharmacists in aiding the sale of the products of such manufacturers only as recognize by their acts the justice of our claim.

The history of the National Retail Drug Association, the recent adoption by it of the Campion plan, after considering it with many others, together with the acceptance of this plan by most of the best proprietors is familiar to you all. The report of our delegation to the meeting of this association recently held in Milwaukee will give the latest and best information concerning the workings of the Campion plan and the prospects of its ultimate success. This plan seems to meet the requirements of retailers in their relation to patent medicines and their proprietors, and leads us to

hope that through its instrumentality this vexing question may be set at rest. It can only accomplish this, however, through the cooperation and active support of those whom the plan is intended to benefit. Manufacturers of patent medicines and cutters of prices are watching our actions most eagerly. A disposition upon our part at this time to hold back will give them reason to claim that we are neither united nor in earnest in our demands and deprive us, perhaps forever, of the justice so nearly within our reach. Resolutions in favor of the action of the National Retail Druggists' Association are well, and are their due, but application for membership is much better. It is the only way we can show our strength, assert our rights, quiet the scoffers who sneer at our imbecility and achieve success.

Is it not proper that the moral, as well as the business attitude druggists should assume towards these and all other secret preparations, be considered? My own conception of this attitude is, that it should be as nearly negative as possible. They should be sold when specifically called for only, and without either recommendation or endeavor upon the part of druggists to substitute supposed better or more profitable preparations. By this course, dealers subserve both professional honor and business integrity. Secrecy in medicine is a relic of a past and ignorant age. Unfortunately it is one which lingers most persistently amid the knowledge of tbe present. A lack of popular education upon all subjects pertaining to medicine, even among otherwise intelligent minds, is very great and is the chief cause of the success of quack physicians and medicines. Not only should secret remedies, formulas and methods receive no countenance from us, but one of the missions of pharmacy should be to endeavor to educate the people to this degree at least, that they look with distrust upon medicines and men, claiming either power or knowledge, the sources of which are shrouded in mystery. By means of this kind of education we may hope to obtain at no distant day, a popular demand for action by Congress, requiring every article claiming to be medicinal to have its composition stated upon its face, thereby removing from it every opportunity for false claims and compelling it to stand upon its intrinsic merits alone.

Retail dealers in liquor is the appellation conferred upon drug-

gists and saloon keepers by a paternal government and made impressive by the exaction of a liberal license fee. The offensiveness of the title, and the injustice of compelling those who sell liquors for medicinal purposes only, to purchase a license, nearly all of you have submitted to with indignant protests. It has been charged, however, that many druggists are fully entitled to the odium implied by the name and it is humiliating to be obliged to admit that the charge is sometimes true. The open and avowed dram seller, who defies the moral sense of the community by pandering to an appetite of human nature, the indulgence of which ruins the body and wrecks the mind, is a character sufficiently low in the scale of humanity. But the pharmacist who prostitutes a noble profession and makes it serve as a cloak for this most ignoble and demoralizing traffic, has gone one step lower. He who thus debases himself and degrades an honorable business, by using it as a means to render vice respectable, can have little appreciation of the high character of his calling and no true sense of honor and virtue. Like the physician, the office of the pharmacist should be to restore, not to destroy, and when for gain he uses his position and means for saving to entice his fellow men to destruction, he is like the wrecker whose false lights lure ships upon fatal rocks, and then mercilessly robs the drowning crew. not speak, my brethren, from the standpoint of the ultra and unreasonable temperance agitator, but from that of one alive to the justice of the sentiment which regards the sale of alcoholic drinks as an employment too disreputable for the members of an honorable guild. Shall we not bring to bear every moral influence we possess to relieve our name from the stigma implied by our classification in the U.S. revenue law, and our reputation from the taint of vicious practice?

COMMISSION TO PHYSICIANS.

Another way, besides those already mentioned, in which selfish greed is manifested by druggists, is in the evil practice which is becoming more and more common of paying commissions to physicians for prescriptions. The practice is both unbusiness-like and dishonorable, and shows a lax conception of commercial morality, or a disregard for it, in both parties to the compact. The victim, after paying the physician, is charged a price for the medicine

which will enable the druggist to pay the physician the commission agreed upon. The arrangement is usually, I suppose, found to be profitable for the conspirators, there being no penalty, and it is one any physician and druggist destitute of the virtue known as honesty can make. No palliation consistent with justice and morality can be urged in its defence and the name properly applied to coalitions of this kind in law is one no pharmacist should wish to deserve.

I have spoken thus plainly, my brethren, of some prominent evils which beset our business, and for which those among us are largely responsible. Correct diagnosis is as important in moral as in physical disease, and the physician is untrue to his calling who fears to warn when the thermometer indicates dangerous condi-After pathology comes treatment, and this I shall leave to the wisdom of the council here assembled. Should they deem the diseases named of sufficient importance to discuss remedies, I would suggest as one proper for consideration, the efficacy of local socie-Where they have been tried, such societies have, I believe, been productive of much good in many ways, but chiefly in the suppression of that spirit of greed which prompts to questionable methods in business. There need never be a lack of subjects for profitable discussion at the meetings. Those pertaining to the business interests of both a local and general nature would be found quite numerous, and when exhausted would be supplemented with the never-ending and always interesting questions of pharmacy. I do not underestimate the difficulty of bringing together, on friendly terms, rivals in business. I am aware that feelings of animosity often exist, very hard to overcome. Yet I earnestly hope my words may induce many to strive to divest themselves of any share they may have in such feeling and endeavor in their own homes to form such associations. Whenever successful, the compensation will come promptly. Not alone in increased profit, but in social and friendly feeling and business and professional advancement. As a means for promoting the establishment of local societies, I would suggest that a simple form of organization and government adapted to their wants be published in the proceedings of this meeting.

A code of ethics, not too extensive or stringent, seems to me quite desirable. A standard of conduct in our relations towards

each other, though of less importance than a standard of knowledge or skill, may prove of very great use. I should be glad to have this matter considered with a view to the preparation and adoption of such a code, if considered important, at the present session.

PROFESSIONAL CHARACTER.

Though the interests which pertain more especially to our character as merchants are of the highest importance, we should never neglect those belonging to our character as pharmacists. Professional knowledge is not only important to success in our business, but its possession should be sought for as a matter of pride and source of happiness. Especially should we endeavor to keep informed regarding the investigations and discoveries of the day, in their bearings upon medicine, chemistry and kindred subjects. It but mildly expresses the fact to state that at no time in the history of the world, have the revelations of science been so wonderful and so extensive as now. New and startling facts in nature, many of them of great value to human life and comfort, are presented to our view daily. So quickly does one discovery follow another that they cease to surprise and the miracle of vesterday is the familiar and commonplace fact of to-day. In the whole realm of scientific investigation no fields are so inviting and none yield such rich rewards to the student as those pertaining to the various branches of knowledge upon which our own profession is founded. Chemistry, botany and the microscope, have invaded the secret places of nature and are exposing their mysteries to the light of day. The giant of the forest, the roadside weed, the mineral of the earth and the water of the sea yield to new methods their hidden virtues for the relief of human ills.

The beginning of the nineteenth century witnessed a new impulse given to the science of chemistry. Its slow development for many centuries, beginning with the efforts of the alchemists to change base metals to gold and to discover the philosopher's stone, culminated in the eighteenth century with the discovery of oxygen by Priestley, and the long contest between the friends and foes, of the Phlogiston theory of combustion. Lavoisier, by his original investigations and exact methods, had placed the science upon a firm foundation and furnished a vast number of facts. The idea

of equivalents, which followed and developed into the atomic theory of Dalton, was at once accepted as the true key to the quantitive composition of bodies. Following in rapid succession came the discoveries of Davy, the wonderful labors of Burzelius, his accurate and numerous analyses and system of symbols, and Faraday's clear conception and elucidation of the relations of electricity to chemistry. Leibig, the teacher and popular author, and a host of others of almost equal talent followed, to usher in and illumine the present era. It is by means of the labors of such giants that the phenomena of nature and the relation of her laws to health, life and human wants are being learned by their disciples in the laboratory, and applied by the pharmacist, the physician and the utilitarian, until not only has medical science been immeasurably advanced, but there is scarcely a process in the arts or manufactures which is not either dependant upon or largely indebted to chemistry for its success. Diseases and epidemics whose destructive agencies produce more than half the mortality of the world are shown by the miroscopes of a Pasteur or a Koch to be caused by living germs or bacteria. A discovery so marvelous must be far reaching in its results to the pharmacist equally with the physician. It must suggest means for prevention and new methods for the treatment of all those diseases which may be found to owe their orgin to the presence of these microscopic organisms. periments have already demonstrated that innoculation with the attenuated virus of some zymotic diseases will produce mild forms of such diseases and render the system proof against further or serious attacks. Does not this point to the belief, wonderful though it may seem, that the day is not far distant when the pharmacist will be called upon and expected to youch for the purity of vaccine virus for diphtheria, scarlet fever, measles tuberculosis, cholera and hydrophobia as well as small pox?

Though our literature abounds with new and interesting information, I shall not occupy your time with anything like a history of pharmacy during the past year. The many excellent periodicals of the day devoted to our interests are, or should be, extensively patronized by Michigan pharmacists, and they contain in much better form than I could present it, all the annual information of value. The proceedings of the American Phar-

maceutical Association, recently held at Milwaukee, will embrace a similar record when published and will of course add largely to current information upon pharmaceutical topics. The report of our own committee to this association will be of interest to us all. The Committee on Pharmacy and Queries will report, among other matters, that a very large proportion of the queries presented at our last meeting have been accepted. This will give us many interesting and valuable papers, which will be listened to with much pleasure, and it is to be hoped, will excite profitable discussion. The chairman of this Committee, Prof. Prescott, has taken a deep interest in this and all other work of our Association and I congratulate you that we have among us a gentleman of his practical knowledge, judgment and experience.

The time is rapidly approaching when the law of the survival of the fittest, will be enforced by the power of public opinion upon pharmacists. When an extended knowledge of the science of his profession will be necessary to his success, and even now, other things being equal, the druggist who is thoroughly grounded in the theoretical, as well as practical knowledge of his calling, has a great advantage over his more ignorant competitor. Young men expecting to enter the drug business in any capacity should understand the importance of thorough and systematic training, and the hope of inspiring this class especially with a desire to avail themselves of the many advantages induces me to call your attention to the claims of the Michigan School of Pharmacy. This school has achieved for itself a reputation, both at home and abroad, which places it in the front rank of institutions of its kind in our country, and inferior in no respect to any of the other departments of that pride of our State, the University. One of the requirements for entering is a general knowledge equal to the standard of high school graduation. This requisite, which I believe is not demanded by other similar schools, is based upon the correct theory that at least this much foundation is needed upon which to rear the superstructure of a good, pharmaceutical education. course of laboratory work and manipulation is required, instead of being optional, as is the rule in schools of the large cities. dents in small sections, aided by teachers, are subjected to extended and practical drills upon crude drugs and other pharmaceutical

material. The writing and filling of actual prescriptions and recitations upon the pharmacopæa are exacted. If we add to these labors, training and work in analytical chemistry, far surpassing in quantity and quality ordinary college requirements, studies in microscopical botany, crystalography, materia medica, covering in all two years of nine months each, we can readily believe that "the graduate is qualified for responsibility, as the chemist of the medical profession and of the community." With few exceptions, the graduates of this school adhere to some of the many callings connected with pharmacy, and may be found as successful proprietors of drug stores, editors of pharmaceutical journals, teachers and managers of manufacturing laboratories, in this and other states.

The facilities offered by the manufacturers of all kinds of chemical and medicinal compounds are not only blessings to the incompetent, but they are likewise a temptation to the educated and practical pharmacist to purchase when he should manufacture. While it cannot be denied that many preparations can be produced on a large scale more economically than in the small quantities required by the retail druggist, and admitting that most manufacturers are skillful and honest, there are still excellent reasons why dealers should themselves prepare such goods when practicable. nearly always profit in so doing. By constant practical exercise of his acquirements the pharmacist more readily retains and adds to such acquirements. Idle moments are made pleasant, as well as profitable, and the shelves are found to be filled with fewer unsalable compounds of rival manufacturers. Something has been done by local societies and individuals to furnish formulæ for popular, unofficinal compounds. The need which exists for this kind of information should, in the interest of uniformity, be supplied by national rather than local authority and a very valuable addition, to the equipment of a pharmacist to-day would be formulæ for preparing salable compounds not yet made official sanctioned by authority, as unquestioned as the U.S. pharmacopæa. with such formulæ, the many so-called pharmaceutical compounds for which some secret of preparation or material is claimed, would be regarded with suspicion and classed with proprietary medicines to be sold only when specifically prescribed or asked for. It is a pleasure to note in this connection and to call your special attention

to the high standard attained by manufacturers of chemical and pharmaceutical preparations in this country. The exhibition of their products, made by many of them at this meeting, is most convincing evidence of this and cannot but excite your admiration. We welcome them, and all other exhibitors of pharmaceutical material, merchandise or appliances most cordially, and I hazard little in predicting that the displays of their products will always be regarded as an agreeable and profitable adjunct to our meetings, especially to the portion of our entertainment while here. An evidence that skill and enterprise are not the only admirable qualities which distinguish them.

The wholesale druggists of Detroit have also aided materially, in many ways, in making our meeting successful.

Reciprocity of interest, between them and ourselves, naturally exists and we are glad to know that we may confidently count upon their aid in all efforts to improve our condition.

The Detroit Pharmaceutical Association have taken upon themselves the responsibility of making our visit to their city one of the agreeable episodes of our lives. This society, to which we are so greatly indebted, is one of those, the character and success of which should serve as a model for the formation of others similar to it in our own homes.

We are also indebted to Frederick Stearns & Co., and Chas. Wright & Co. in efforts to add to the social enjoyments of this occasion.

Our executive committee, aided by Mr. A. W. Allen, our local secretary, has done much hard work in arranging a program and caring for the various details incident to the session. They are entitled to much credit for the admirable manner in which the work has been done. The arrangements made for social enjoyments during the session are upon that generous scale of hospitality which distinguish pre-eminently the citizens of Detroit. Our brethren of this city in every department seem to have vied with each other in efforts to make the occasion one long to be remembered for that graceful and unostentatious courtesy which finds its truest expression in endeavors to promote the happiness of the guests. Our reliable and tireless Secretary, whose labors have been very great, together with the other officers of our association, have

done cheerfully and promptly whatever their hands have found to do. Their reports, together with those of the various committees, will furnish pleasing evidence of our prosperity and of the work done throughout the country, during the year, in legislation and upon other subjects relating to professional and business interests. Our initial membership, combined with the large number of applications pending to-day, indicates unmistakably that druggists of Michigan are alive to the importance of combined effort to raise to the highest point their business, social, and professional standing.

Thanking you, gentlemen, for the courteous treatment and kind forbearance I have received at your hands, let me request a lenient judgment of the errors I may make in the discharge of the important duties your partiality has honored me with, until the close of the session gives you the opportunity to fill my place with one more worthy.

Mr. Watts, of Grand Rapids, moved that a committee of three be appointed by the President to take into consideration the recommendations contained in the annual address of the President, to report at the next meeting; which motion prevailed.

The President stated that he would announce the committee later in the session.

A communication was received from Frederick Stearns & Co. inviting the association to visit their laboratory at some time during its meeting, at the convenience of the association. Mr. Frederick Stearns also extended an invitation to the members to attend a Conversazione at his residence at 8. P. M; both of which invitations were accepted.

Mr. Isaac Watts, of Grand Rapids, moved that an invitation be given to physicians and the local Pharmaceutical associations of the city to attend the sessions of the association. Carried.

The President: I would state, gentlemen, that we have up to the present time received 261 applications for membership in this association. (Applause.) And the Secretary is now ready to report upon the names of the applicants.

The Secretary then read the following names:

Chas. H. Adams, Otsego. A. P. Alexander, Albion. F. G. Aldworth, Grand Rapids. H. D. Cushman, Three Rivers.

Ellery Anderson, Midland. R. J. Cummer, Cadillac.

Maxon Anderson, Midland. S. N. Androus, Flint. Henry Arbour, Chippewa Lake. M. T. Arbour, Orangeville Mills. Chas. H. Atwater, Lapeer. E. L. Baldwin, Talman. Thos. A. Baxter, Grand Rapids. E. C. Bassett, South Lyon. Arthur Bassett, Detroit. A. Christian Bauer, Gd Rapids. F. S. Barbour, Clifford. Wm. E. Belsher, Saginaw. Julius Bertram, Alpena. C. B. Beachum, Romeo. Lyman F. Beach, Bay City. John R. Bennett, Muskegon. C. E. Bird, Saugatuck. Wm. H. Bigelow, Owosso. C. P. Bigelow, Grand Rapids. W. E. Birge, Kalamazoo. H. A. Blackmar, Charlotte. Oliver Bolio, Eaton Rapids. Chas. L. Brooks, Saginaw. M. L. Bridgeman, Menominee. R. G. Burwell, Fort Gratiot. Sid. V. Bullock, Howard City. H. H. Burdick, Bay City. C. S. Burroughs, Clinton. James W. Caldwell, Detroit. Hubert Carrier, Bay City. M. Chamberlain, Horton. C. A. Chandler, Cambria Mills. H. M. Church, Holly. Jerome F. Clarke, Climax. Louis K. Clark, Elsic. James K. Clark, Blissfield. W. O. Clark, Middleville. H. W. Cleveland, Nunica. C. E. Cook, Durand. H. G. Colman, Kalamazoo. L. S. Coman, Bay City. David M. Cooper, Detroit. Thomas D. Coe, Romeo. John J. Crowley, Detroit. Gilbert T. Haan, Grand Rapids. H. E. Harrison, Richmond. Dwight A. Harrison, Kalamazoo. John H. Lobdell, Flat Rock.

James E. Davis, Detroit. A. C. Dahm, Mount Clemens. J. A. Damon, Millington. Wm. M. Demerest, Fowlerville John De Boe, Grand Rapids. S. H. Dimick, Ypsilanti. Wm. H. Dodds, Detroit. Thos. Dunlap, South Lyon. Alexander Eckerman, Muskegon M. C. Empey, South Bay City E. B. Escott, Grand Rapids. F. H. Jacob S. Farrand, Detroit. Clarence A. Fellows, Big Rapids Alfred S. Fildew, St. Johns. Washington Foster, West Branch W. W. Fordham, Traverse City. Wm. H. Foot, East Saginaw. Lucien Fournier, Detroit. Seymour F. Frizelle, Detroit. Cleveland L. Robert Fulton, C. Broussais Fuqua, Gd Rapids. Daniel J. Gahan, Flint. Theodore O. Gates, East Tawas. A. R. Gardner, Pottersville. Northrup C. Gibbs, Big Rapids. Wm. J. Gill, Beacon. Geo. H. Gover, Mt. Pleasant. Arthur A. Goodsell, Jasper. Lester A. Goodrich, Hillsdale. Oliver H. Grunow, Detroit. Will F. Griffith, Howell. A. W. C. Gregory, Albion. Thomas J. Harvey, Farmers. John P. Haller, Sault St. Marie. Harry G. Hamilton, East Sag'w. Douglas S. Harris, Jackson. Lineas I. Halsey, Utica. Rodney A. Hastings, Sparta. Amos Hanlon, Middleville. G. M. Harwood, Petoskey. Wm. A. Hall, Greenville. Henry T. Hartz, Detroit.

Dayton S. Hallock, Detroit. John E. Hurd, Detroit. J. A. Herrington, Belleville. [. S. Hewitt, Milford. Will Hessler, Rockford. S. J. Heimbach, Constantine. Fred Heath, Muskegon. Hiram C. Hedges, N'h Lansing. Dayton W. Higgins, Morley. Frank Hibbard, Evarts. Irving F. Hopkins, Muskegon. Frederick Hotchkiss, Hastings. John G. Hogeboom, Saginaw. Frank Houp, Detroit. Wm. Hutchings, Leslie. John E. Hunter, Grand Rapids. Albert E. Hurd, Davison Station. Willard Jefts, Big Rapids. James G. Johnson, Traverse City Oliver C. Joslen, St. Johns. Wm. J. Kay, Tyre. Walter Kephart, Berrien Springs John Moore, Ann Arbor. Fred H. Kelly, AuSable. Ezra J. Kennedy, Traverse City. Theo. Kemink, Grand Rapids. John H. Kellogg, East Saginaw. E. H. Kendrick, Millbrook. C. H. Kirkwood, Ishpeming. Austin D. Kibbie, Custer. Bruce F. Kinmont, Vandalia. John L. Kimball, Crystal Falls. Frank E. Kipp, Grand Rapids. Chas. W. Kothcher, Detroit. W. W. Kenyon, Howell. E. M. Lacey, Sault St. Marie. Benj. L. Lambert, Detroit. Robert T. Latimer, Jackson. John Lamoreux, Lakeview. Sarah A. Theo. A. Laubengayer, Owosso. Harris D. Purdy, Sparta. John F. Albert B. Lee, Detroit. Henry Lever, Newaygo. Richard Leuschner, Detroit. II. Leonard, Muskegon. Thomas H. Richards, Detroit.

Byron W. Long, Portland. W. E. Loomis, Edgar B. Longwell, Paw Paw. A. B. Lyon, Detroit. T. C. Maynard, Gagetown. Calvin L. Martin, Elk Rapids. W. R. Mandigo, Sherwood. John A. MacKimmie, Detroit. Frank W. Mayer, Schawaing. Thomas Madill, East Saginaw. Henry Martin, Jackson. David McDonald, Kalamazoo. E. F. McQueen, Mt. Pleasant. M. C. Merrell, Webberville. Homer L. Mead, Escanaba. D. C. Meseroll, Jackson. Thos. J. Milliken, St. Clair. Victor H. Middleton, Gd Rapids J. B. Miles, Dexter. A. D. Morford, Ypsilanti. Wm. B. Moore, East Saginaw. Wm. Mulloy, Mindero City. A. W. Myers, Gobleville. E. H. Nelson, Detroit. Henry C. Neff, Cyrus P. Newell, Flushing. Gideon Noel, Palo. Wm. S. Nowell, Laingsburg. James Nurney, AuSable. John J. Orr, Tecumseh. H. P. Pegg, Morenci. John D. Petrie, Detroit. C. M. Peacock, Corunna. Franklin S. Phillips, Ogden. Robert J. Pinkerton, Bancroft. Sheldon Pitcher, Detroit. Randolph Platts, Port Sanilac. James O. Power," Mike Reidy, Corunna. John A. Reck, North Lansing. Francis M. Reasner, Jackson. L. G. Ripley, Montague. Eugene Ringler, Saginaw. E. C. Varnum, Jonesville.

E. J. Rodges, Port Huron. Byron J. Robertson, Breedsville. Werner Von Walthausen, Wm. Rowe, Scottville. Frank G. Row, Lansing. Theodore Royer, Jr., Ann Arbor Louis Rudolphi, Dowagiac. Aaron B. Saltzer, Detroit. Joseph Schanher, Negaunce. George R. Scoville, Manistee. D. A. Schumacher, S. Boardman F. A. Schlieper, Bay City. W. E. Short, Manistee. C. L. Sherwood, Dowagiac. Wm. E. Sheffield, Vestaburg. Harvey W. Smith, Farmers. Arthur B. Smith, Trenton. Fred D. Smith, Detroit. C. A. Soule, M. Ella Spenser, Linden. Otto L. Sprague, Fair Grove. George G. Steketee, Gd Rapids. Clarence G. Stone, Detroit. Fred Stearns, Geo. W. Stringer, James A. Taylor, Edward J. Taylor, Vassar. Wm. H. Teetzel, Detroit. Hugo Thum, Grand Rapids. Wm. A. Tomlinson, AuSable. Nelson I. Tobey, Evart. Theo. Trowbridge, Decatur. A. B. Treat, Adrian. Del. D. Turner, Whitehall. John R. Tweedale, Battle Creek Ezra V an Marter, Leslie B. D. Vaughan, Charlotte. Grosvenor C. Varnum, Jonesville

N. Vanden Belt, Detroit. Mackinaw City. James Vernor, Detroit. S. Edwin Wait, Traverse City. Grafton Waples, Detroit. John B. Watson, Coopersville. Geo. W. Waite, Coldwater. Herman G. Watz, Saginaw. Wm. A. Warner, Detroit. Geo. J. Ward, St. Clair. Leonard B. Wells, Pontiac. Herman L. Weis, Detroit. Daniel Weston, Buchanan. Arthur H. Webber, Big Rapids. Wm. L. White, Grand Rapids. N. L. Wheelock, Dowagiac. B. I. Whelpley, Hoytville. Chas. F. Wheeler, Hubbardston. Robert L. Whitton, Clifford. Wm. A. Wilson, St. Johns. Walter A. Wilson, Birmingham. Geo. A. Wilson, Charlevoix. Aldolph H. Wilson, Gd Rapids. John Williamson, Detroit. Wm. C. Williams, John L. Wilkinson, Bay City. Al. H. Wiggins, Lawrence. A. F. Withe, Pontiac. M. G. Woodward, Lake City. C. E. Wolfinger, Hopkins Sta'n. James E. Wood, Charlevoix. Fred F. Woolsey, Hartford. T. J. Wrampelmeier, Ann Arbor Frank J. Wurzburg, Gd Rapids. C. A. Young, Battle Creek.

They were referred to the Executive Committee for recommendation.

On motion of Prof. Pre scott an invitation was extended to ladies to attend the sessions of the association.

The Secretary presented letters from members of the association, expressing regrets at their inability to be present, and wishing that the meeting would be a profitable onc,—and assuring the members of their hearty sympathy in its work.

On motion the communications were accepted and placed on file.

THE SECRETARY: I wish to make a motion before we adjourn, and that is that Samuel Smith Garrigues, Ph. D., of Ann Arbor, be elected an honorary member of this association. He has always been an earnest worker in the cause of pharmacy. He was a member of the old association and struggled hard with the Legislature at that time to secure the passage of a pharmacy bill. He is now old and infirm, his eye-sight is becoming dim, and he is worthy of any honor we can bestow upon him.

The motion prevailed.

The association then adjourned until 7:30 P. M.

EVENING SESSION.

Meeting called to order by the President.

The President announced as Committee on President's address in accordance with the resolution already passed: Isaac Watts of Grand Rapids, C. P. Parkill of Owosso and J. C. Mueller of Detroit.

The Secretary announced the names of the following persons as applicants for membership: L. E. Phelps of Flint, A. H. Bigg of Detroit, Wm. Johnson of Detroit, and the same were referred to the executive Committee for action.

THE PRESIDENT: We will now listen to the report of the Executive Committee.

G. W. CROUTER, of Charlevoix: Your Executive Committee would respectfully report that they have examined the applications of persons desiring to become members of this association, and would recommend the 264 applicants whose names have been read by the Secretary for membership.

On motion of Mr. Watts the Secretary was authorized to cast the ballot for the association, and they were then declared elected.

MR. CROUTER: I wish to say that the Executive Committee will submit a further report at the morning session to-morrow.

The newly elected members were then requested by the Presi-

dent to sign the register, and an intermission of fifteen minutes was taken for such purpose.

The meeting being again called to order, the President announced that the next business in order would be the reports of committees and the reading of papers.

The Committee on Trade Interests submitted the following re-

port, through Mr. F. W. Fincher, its chair man:

MR. PRESIDENT AND GENTLEMEN OF THE MICHIGAN STATE PHARMACEUTICAL ASSOCIATION:—Your Committee, after due consideration of the subject of "Trade Interests," would respectfully submit the following report:

It has been our aim to allude briefly only to those evils and practices which tend to lower our profession as Pharmacists, and rob us of our legitimate trade and the reasonable profits to which

we are justly entitled.

The difficulties with which we meet seem to vary in the different localities. Thus in the cities we are informed that the wholesale houses interfere to a certain extent with the retail trade by selling indiscriminately to all at the same, or nearly the same price, thus giving to consumers who seek it the benefit of the wholesale price. And in the smaller towns another obstacle confronts us which the larger towns are comparatively free from, and that is the selling of drugs and patent medicines by grocers and general dealers.

Another evil concerning which we think the retail trade have a right to complain, is that of manufacturing establishments sending their agents through the country soliciting the trade of physicians direct, and in some instances selling their products at lower prices than are given to the regular trade. As further inducement to sell the pharmaceutical products of their own manufacture, they supply chemicals and crude drugs in which they do not pretend to deal, at the lowest wholesale price.

But of all the evils of which we have to complain the greatest is probably the tendency to ruinous competition in the cutting of

prices on proprietary goods.

Another matter which is deserving of our attention is that of the character of the liquor license which the U. S. Government renders obligatory upon every retail druggist to procure. This license places the druggist who wishes to sell liquors only for medicinal purposes on a level with the lowest rumseller of the land. This is a reproach upon an honorable profession which should not be endured, if it can be avoided.

We have simply endeavored in a general way to summarize those evils that are affecting the well-being of the retail drug trade, feeling that to treat of all of them in all their bearings would be impracticable in a report of this kind. We feel, however, that the trade owe a debt of gratitude to the N. R. D. A. for their labors in its behalf, and would recommend that this body pass a resolution that it is the sense of the association that notenily all its members but every retail druggist in the State of Michigan should give the N. R. D. A. their practical support by at once becoming members of that association.

We also believe that in the full carrying out of the Campion Plan we have the best method that has yet been presented for doing away with the cutting of prices on proprietary medicines.

As regards other matters mentioned in this report, we would suggest that a full and free discussion by the members of this association would result in something more tangible and practical than any recommendation we might be able to offer.

We would further say that in the very admirable address of our President, Mr. Wells, the subject of "Trade Interests" has been treated so ably and fully that we feel that we can add nothing that would be of any additional value or interest to the association.

All of which is respectfully submitted.

F. W. FINCHER,
J. C. MUELLER,
GEORGE McDonald,
Committee.

On motion of Mr. Gundrum, the report of the Committee on Trade Interests was accepted and adopted.

THE PRESIDENT: I would suggest that the reports of committees, or any suggestions by them, can be taken up and discussed at any time. It would, perhaps, be better for us this evening to merely accept the reports of the committees and adopt them, if desirable, leaving their discussion to the future, but of course it is for the association to deal with them as it thinks best.

The report of the Committee on Pharmacy and Queries was then submitted through Prof. Prescott, and is as follows:

The reports on queries have been more or less full. Some queries were of such a nature as admitted of a very brief answer. Some queries were of such a nature that long investigation was required to give a satisfactory report. In some instances the papers have been placed in our hands and in others not. I am not able at this time to state precisely how many papers are at the disposal of the Committee, but I think over two-thirds of the 22 or 23 accepted queries have been fulfilled in the presentation of pa-

pers. Your Committee has prepared a partial list of queries accepted for report at the next annual meeting, and I will read these, so far as the Committee is prepared to report them. Permit me to say that I am directed to call upon members of the association to suggest queries at any time they may care to at this session. This may be done through any of the members of the Committee. In this way we shall have a better list than the Committee could present, and the queries so submitted may suggest others.

(For full list of queries proposed, see subsequent pages.)

Prof. Prescott also read a paper at this time upon the pharmacopæia, giving four reasons why it should be used by druggists.

(See subsequent pages.)

On motion of Mr. Watts, the report and paper were received and adopted, and the thanks of the association were tendered to Prof. Prescott for his very interesting and instructive remarks.

THE PRESIDENT: Are there any other committees ready to report? Is the Committee on Legislation ready to make its report?

MR. WILSON, chairman of the Committee on Legislation, stated that his Committee was not ready to make a report and asked an extension of time until to-morrow morning, which was granted.

THE PRESIDENT: We should be very glad to hear from the delegations appointed to attend the meeting of the National Retail Druggists' Association and the National Pharmaceutical Association, if there are any of them present. Can they state whether they have any report to make?

MR. GEO. McDonald, of Kalamazoo, stated that he was a delegate to the American Pharmaceutical Association, and that Mr. Gundrum was there also and that he would make a report.

MR. GEO. GUNDRUM, of Ionia: I was there only a few days, arriving later than Mr. McDonald. I would report that we had a very pleasant meeting, and everything passed off as well as could be wished. I believe there is nothing that requires special mention before this association. Mr. Jesson was at the meeting before I arrived, and I would like to hear from him.

MR. JESSON: I was not a delegate to the Milwaukee meeting of the N. R. D. A., and inasmuch as our Association had two members present who were delegates, Mr. Perry and Mr. Pinkey, I did not prepare a report. The meeting was very interest-

ing, and the members present were a class of men who thoroughly understood their mission. The discussions at times were warm and very animated, requiring a first-class parliamentarian to keep matters moving smoothly, but President Capning was equal to the occasion and proved himself so acceptable, as did all the other officers, that they were unanimously re-elected, which was a deserved compliment to the efficient manner in which they had conducted the affairs of the Association during the year. F. W. R. Perry, of Detroit, was elected a member of the Executive Committee. Quite a number of Michigan pharmacists attended the meetings of the A. P. A.—George Gundrum, of Ionia, and George McDonald, of Kalamazoo, as delegates: also Mr. Ronnefeld and Mr. Caldwell of Detroit, Mr. of Manistee, Mr.LymanMcDonald of Calumet, and your Secretary. Michigan druggists should secure a membership in both of these associations. The usual routine business was attended to, including report of officers, election of officers, etc. The reading of papers and the discussion on the same are always interesting, where so large a body of scientific men are brought together. One member's absence was very much regretted by all-that of Dr. Prescott, who was at the sea shore regaining his health. The next annual meetings of the two Associations will be held at Pittsburg in September, 1885.

The Secretary asked leave to submit several other applications for membership and have them referred to the Executive Committee.

MR. BASSETT: I understand there are a number of applications here for membership in this association. The druggists of Detroit desire to give a ride and a banquet to the members of this association to-morrow. I see by the constitution there is no provision for electing members after this evening, and I understand that has already been done. I now move that the rules be suspended in order that these persons may be elected members of the association this evening. We very much desire to ascertain the number of persons we must provide for at the banquet and boat ride.

The motion was carried and the names of the following applicants were submitted and referred to the Executive Committee:

Harry A. Sorg, Kalamazoo.

Albert F. Martin, Imlay City.

John W. Hall, Hudson.

Louis Ruchty, Detroit.

A. B. Schumaker, Grand Ledge.

S. J. Harvey, Detroit.

The Executive Committee reported on the above applicants favorably and on motion the Secretary cast the vote of the convention, and they were duly elected.

MR. BASSETT: The druggists of Detroit have very kindly contributed to defray the expenses of the excursion upon the river to-morrow to be tendered to this association. The boat leaves the foot of Woodward Avenue at 2 o'clock. An invitation is extended to this association, to the wholesale and retail druggists of the city and to their customers to participate in the excursion.

The invitation was accepted.

On motion the association adjourned to 9 o'clock to-morrow morning

WEDNESDAY MORNING SESSION.

The association was ealled to order by the President, Mr. Frank Wells.

The Secretary stated that he had some additional applications for membership to offer.

THE PRESIDENT: If there are no objections the Secretary will read the names of the applicants that have been brought in this morning and the Executive Committee will report at once.

The Secretary reported the following names:

George O. Pratt, Detroit.

Wm. S. Johnston "

Harry J. Hyde, Marshall.

William L. Hyde, "

Daniel L. Shook, Coral.

Charles W. Bahel, Otsego Lake.

Henry Bird Jr., Douglas.

The executive committee reported favorably upon the above names, and they were duly elected.

Inquiry was made of the President as to whether lady pharmacists were eligible to membership and the inquiry was answered in the affirmative.

Mr. G. W. Crouter, Chairman of the Executive Committee, then read its annual report as follows.

TO THE PRESIDENT AND MEMBERS OF THE MICHIGAN STATE PHARMACEUTICAL ASSOCIATION:—During the past year your Executive Committee have audited the following bills:

Engraving certificates		-		-				-		\$ 60	00
Printing proceedings,	-		-		-		-		-	148	32
" pharmacy bill,		-		•		-		-		'7	00
Telegraph bills,	-		-		-		-		_	2	90
Engrossing certificates,		-		. .		-		_		21	45
Ledger, -	-		-		-		-		-	7	00 00
Stationery,		-		-		-		-		7	75
Express charges,	-		-		-		-		_	•	90
Stamps, postage, -		-		-		-		-			05
Mailing list,	-		-		-		-		_	_	25
Application blanks and	circ	ulars,		-		-		-			50
Address labels, -	-		-		-		_		_		25
Printing bill, -		-						-			50
Memorandum books,	-		-		-				-	I	40
Secretary's salary, -		-		-		-				50	00
" Jesson, last y	year	's acc	oun	ts,			•		-	75	00

\$500 27

A meeting of your Committee was held at Detroit on June 16th, and in conjunction with your President, Local Secretary Allen, Secretary Jesson, and others, arranged the program for the present meeting, as announced by circular.

As instructed last year, we had prepared a lithograph certificate of membership at a cost of \$60 for 300 blank copies. All future orders will be supplied at a cost of \$10 per 100 copies.

Shortly after the close of last year's session your Committee fixed the bonds of the Secretary and Treasurer at \$1,000 each, which bonds were duly presented by the Secretary and Treasurer and approved by your Committee.

As directed, your Committee placed the publication of the annual proceedings in the hands of the publishers of the Druggist, Chicago, the cost of which for 1,500 copies amounted to \$148.32. The receipts for advertisements therein amounted to \$120, leaving a net cost for the proceedings of only \$28.

Though the by-laws provide only for a copy of the proceedings to each member, your Committee deemed it expedient and wise to

forward a copy to every druggist in the State as the best means of arousing general interest in the association and promoting its prosperity.

All of which is respectfully submitted.

G. W. CROUTER,
H. J. BROWN,
F. M. ALSDORF,
GEORGE McDONALD,
O. P. SAFFORD,
Committee.

MR. CROUTER: I would say in addition, Mr. President, that the Executive Committee made no report last year to this association, and we thought it best that our report should start at the beginning of the organization.

On motion of Mr. Gundrum, the report of the Committee was accepted and adopted.

THE PRESIDENT: The report of officers is now in order. You will now listen to the report of the Secretary.

SECRETARY'S REPORT.

TO THE OFFICERS AND MEMBERS OF THE MICHIGAN STATE PHARMACEUTICAL ASSOCIATION. GENTLEMEN:-It is with a great deal of pleasure that I make this first annual report to the Michigan State Pharmaceutical Association. One year ago today an association did not exist, in fact it was believed by many that one could not be successfully formed in this State; but the call found the druggists ready, and to-day we have a strong association, representing the most advanced elements of the drug trade. The increase in membership has been such as to meet our most sanguine expectations and the prospects for the future are extremely flattering. One hundred and forty-nine persons became members of the organization at Lansing; two hundred and seventy-seven have joined the association at this meeting. One name has been dropped from the roll; he signed the constitution and by-laws at Lansing but failed to pay his initiation fee and dues. This was done with the consent of the executive committee.

Our finances, as you will see by the Treasurer's report, are in a flourishing condition.

The proceedings were received in April and one copy was mailed to each member, also one copy to the drug firms in the State whose address I could obtain. Complimentary copies have been received from and sent to New York, Wisconsin, Missouri, Iowa, Illinois, Maryland, Connecticut and Massachusetts. I also

mailed copies to the pharmaceutical journals. Immediately after the close of last meeting, I procured a draft of a certificate of membership which was submitted to the executive committee, and which with slight alterations met with their approval. Three hundred copies were procured at a cost of \$60. Additional copies will cost \$10 per 100; 143 copies have been disposed of to members; 14 were spoiled by the engrosser, leaving on hand 143 copies. Of our new members, 214 have paid for certificates. The executive committee and officers held a meeting in Detroit in June and arranged a program for the present meeting. Thirteen hundred copies were printed, and together with an application blank mailed August 1st to the members and druggists in the state. The work necessarily connected with the office of Secretary is laborious and trying, 1equiring much time and attention, but I have aimed to labor for the advancement of our interest, without regard to personal convenience. And if errors have been committed I trust they are few and unimportant and will be kindly overlooked.

I have mailed during the year 1,400 copies of the proceedings, 2,500 application blanks, 1,300 calls for the second annual meeting and answered 500 letters that required a written answer, using \$60 worth of postage stamps. The following statement commences with the organization, in order to have some foundation to work

upon in the future:

TOTAL CASH RECEIPTS!

Nov.	15.	1883. To	147 init	iation	fees			-		-	\$	147	00
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April	15,	Expressag	e on pro	oceedi	ngs,	-		-					oo
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66		Expressag				-		-					90
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"	"	2,000 appli	cation	blanks,	-	-		-		4 00
66	"	1,500 calls	for m	eeting,	-		-		٠-	10 50
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\$1,392 00

JACOB JESSON, Secretary,

Muskegon, Mich.

WILLIAM DUPONT, Treasurer, said: I do not know that it is necessary for me to go into details, the items having been stated by the Secretary in his report. I beg leave to submit the following report:

DETROIT, Sept. 9th, 1884.

Treasurer's Report, Michigan State Pharmaceutical Association.

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1883. Nov. 15, 1884.	То	cash,	-		-		•		-	409 00	
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Aug. 30, To cash 100 00 Sept. 6, " " 100 00 " 9, " " 165 95 " " " " 207 05 " " " 210 00 —————————————————————————————————
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Telegraph Co., - 75 00 ## W. S. George & Co., - 70 00 ## Calvert & Co., - 60 00 ## G. P. Engelhardt & Co., 148 32 Sept. 9, ## Jacob Jesson, on orders, - 207 05
ISBURSEMENTS. CR. 1883. Nov. 15, By paid Jacob Jesson, 75 00 " " Telegraph Co., - 2 90 " " W. S. George & Co., - 7 00 1884. Mar. 3, " " Calvert & Co., - 60 00 " 31, " " G. P. Engelhardt & Co., 148 32 Sept. 9, " " Jacob Jesson, on orders, - 207 05
Nov. 15, By paid Jacob Jesson, - 75 00 " " Telegraph Co., - 2 90 " " W. S. George & Co., - 7 00 1884. Mar. 3, " " Calvert & Co., - 60 00 " 31, " " G. P. Engelhardt & Co., 148 32 Sept. 9, " " Jacob Jesson, on orders, - 207 05
Nov. 15, By paid Jacob Jesson, - 75 00 " " Telegraph Co., - 2 90 " " W. S. George & Co., - 7 00 1884. Mar. 3, " " Calvert & Co., - 60 00 " 31, " " G. P. Engelhardt & Co., 148 32 Sept. 9, " " Jacob Jesson, on orders, - 207 05
" " Telegraph Co., - 2 90 " " W. S. George & Co., - 7 00 1884. Mar. 3, " " Calvert & Co., - 60 00 " 31, " " G. P. Engelhardt & Co., 148 32 Sept. 9, " " Jacob Jesson, on orders, - 207 05
" " W. S. George & Co., - 7 00 1884. Mar. 3, " " Calvert & Co., - 60 00 " 31, " " G. P. Engelhardt & Co., 148 32 Sept. 9, " " Jacob Jesson, on orders, - 207 05
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Balance on hand, 891 73
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\$1,392 00
RECAPITULATION.
Total amount received, \$1,392 00
,0)
" " paid out, 500 27
Leaving balance an hand, \$ 891 73
WM. Dupont, Treasurer.

Mr. Watts moved that the reports of the Secretary and the Treasurer be received and adopted.

MR. CROUTER: I should not be in favor of that motion. Properly the reports should go to the Executive Committee for examination; but in order to save time the Executive Committee has already examined these reports and they are correct.

PROF. PRESCOTT:—As a matter of precedent, as the action must go upon the record, it perhaps would be better to refer it to the Executive Committee.

THE PRESIDENT:-The Executive Committee reports that they have examined it.

PROF. PRESCOTT:—I move as a substitute that the reports of the Treasurer and Secretary be referred to the Executive Committee for examination and that they report at their earliest convenience.

Substitute carried.

MR. CROUTER:-The Executive Committee has examined

closely these reports. They have gone over every item and every bill and have handled every voucher. They find the accounts of the Secretary and Treasurer correct to one cent. We found one error in Mr. Jesson's account whereby he had made a mistake against himself of one dollar; that error was corrected.

PROF. PRESCOTT: --I move that the report of the Executive Committee, auditing the accounts of the Secretary and Treasurer, be accepted and adopted; which motion prevailed.

Mr. Wilson, Chairman of the Committee on Legislation, announced that that committee was ready to report, and copies of the pharmacy bill were handed to members of the Association.

To the Officers and Members of the Michigan State Pharmaceutical Association: Your committee on legislation

beg leave to submit the following report:

The pharmacy bill which was presented at the time of the organization of this Association in November last, we have had under consideration, and while we consider the original bill a very excellent one, yet we have in looking it over very carefully and spending considerable time in doing so, decided to make some changes and a few additions which in the opinion of your committee were desirable.

We have added a clause in reference to persons not qualified as assistants, that they shall not be allowed to compound physicians' prescriptions or sell poisons, except under the immediate supervison of a registered pharmacist or registered assistant, after line 12, Sec. 4.

We also make a change in the manner in which the members of the Board of Pharmacy shall be appointed. (Sec. 10, line 15.)

Also a clause referring to the sale of domestic drugs and remedies by country stores and others.

And in place of Sec. 12, page 5, of the printed bill, we insert an entirely new section relating to the sale of poisons, etc.

There are a few other minor changes, which you will notice

when the bill is read by comparing with the original.

The subject of pharmaceutical legislation is in keeping with the spirit of this progressive age, and not only educated physicians and pharmacists but the people are demanding laws of this character for the protection of the public against ignorant and incompetent druggists and dispensers of medicine. A large number of states now have laws regulating the practice of pharmacy. The Ohio legislature last year passed a law similar in character to the one here proposed. The legislature of New York also passed a pharmacy law last spring, and I trust when our legislature meets again

that Michgan will not be behind her sister states in that respect, and that we may have to report at our next meeting a good, practical law on our statute book regulating the practice of pharmacy in Michigan. Your committee would recommend that a special committee be appointed at this meeting for the purpose of urging the passage by our legislature of such legislation as may be adopted by this Association, for while the ball is in motion let us keep it rolling until we have laws in keeping with the advanced position of pharmacy, which will not only be a protection to the people generally, but to the pharmacists also, in keeping out of our profession ignorant impostors, incompetent quacks, and raise the profession of pharmacy to the highest position to which it is entitled.

MICHIGAN PHARMACY BILL.

Section I - Be it enacted, etc. - That it shall not be lawful for any person to open or conduct any pharmacy, drug store, or place for retailing, compounding or dispensing drugs, medicines or poisons for medical use unless such person shall be registered under the provisions of this act, or shall employ or place in charge of such pharmacy or store a registered pharmacist within the meaning of this act, except as hereinafter provided.

Sec. 2.—Every person who shall within three months after this act shall take effect, forward to the Board of Pharmacy, hereinafter mentioned, satisfactory proof, supported by his affidavit, that he was engaged in the business of a dispensing pharmacist on his own account in this State at the time this act takes effect, in the preparation of physicians' prescriptions, and in the vending and compounding of drugs, medicines and poisons, shall, upon the payment of the fee hereinafter mentioned, be granted a certificate of registration: *Provided*, that in case of failure or neglect to register as herein provided, then such person shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy, hereinafter described.

Sec. 3.—Licentiates in pharmacy shall be entitled to registration, and must be such persons as have passed a satisfactory examination before the State Board of Pharmacy, hereinafter mentioned. The said Board may grant certificates of registration, without further examination, to the licentiates of such other boards of pharmacy, as it may deem proper.

SEC. 4.—Any assistant or clerk in pharmacy who shall not have the qualification of a registered pharmacist, within the meaning of this act, not less than eighteen years of age, who at the time this act takes effect, shall be engaged in such service, and have been employed or engaged two years or more in drug stores where the prescriptions of medical practitioners are compounded, and shall

furnish satisfactory evidence to that effect to the State Board of Pharmacy, shall upon making application for registration, and upon the payment to the Secretary of the said Board of a fee of one dollar, within three months after this act takes effect, be entitled to a certificate of a "registered assistant," which said certificate shall entitle him to continue in such duties as clerk or assistant; but such certificate shall not entitle him to engage in business on his own account unless he shall have had at least five years' experience in pharmacy at the time of the passage of this act. nually thereafter during the time he shall continue in such duties, he shall pay to the said secretary a sum not exceeding fifty cents, for which he shall receive a renewal of his certificate. No person not a qualified assistant shall be allowed by the proprietor or manager of any retail drug store or pharmacy, to compound or dispense the prescription of physicians, or the selling of poisons, except under the supervision of a "registered pharmacist" or a qualified assistant, under this act.

SEC. 5.—The Governor, with the advice and consent of the Senate, shall within thirty days after the passage of this act, appoint five persons from among such competent pharmacists in the State as have had ten years' practical experience in the dispensing of physicians' prescriptions, who shall constitute the Michigan Board of Pharmacy. The persons so appointed shall hold their offices for four years: Provided, that two members of said board shall be appointed and hold their office for two years, and three hold office four years, or until their successors shall be appointed and qualified, and all vacancies occurring shall be filled by the Governor, with the advice and consent of the Senate. And provided also, that appointments made when the Senate is not in session may be confirmed at its next ensuing session. The Michigan Pharmaceutical Association shall annually report directly to the Governor, recommending the first year the names of at least ten persons, whom said association shall deem best qualified to serve as members of the Board of Pharmacy, and the names of at least three persons each year thereafter, to fill any vacancies which shall occur in said

Sec. 6.—The said Board shall, within thirty days after its appointment, meet and organize by the election of a president and secretary from its own members, who shall be elected for the term of one year, and shall perform the duties prescribed by the Board. It shall be the duty of the Board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to cause the prosecution of all persons violating its provisions; to report annually to the Governor and the

Michigan Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said Board for the year, and also the names of all pharmacists duly registered under this act; the board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in three months; it shall give thirty days' public notice of the time and place of such meetings; shall have power to make by-laws for the proper fulfillment of its duties under this act, and shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. Three members of said board shall constitute a quorum.

Sec. 7.—Every person applying for registration as a registered pharmacist, under section two of this act, shall, before a certificate is granted, pay to the secretary of the board the sum of two dollars, and a like sum shall be paid to said secretary by licentiates of other boards who shall apply for registration; and every applicant for registration by examination shall furnish satisfactory evidence of good moral character, and shall pay to the secretary the sum of five dollars: *Provided*, that in case of the failure of any applicant to pass a satisfactory examination his money shall be held to his credit for a second examination after three months.

SEC. 8.—Every registered pharmacist who desires to continue the practice of his profession, shall annually thereafter, during the time he shall continue in such practice, on such date as the Board of pharmacy may determine, pay to the secretary of the said Board a registration fee of one dollar, for which he shall receive a renewal of said registration. Every person receiving a certification of registration under this act shall expose the same conspicuously in his place of business.

SEC. 9.—The secretary of the Board shall receive a salary which shall be fixed by the Board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of the Board shall receive the sum of five dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in attending the meetings of said Board. Said expenses shall be paid from the fees received by the Board under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be held by the secretary as a special fund for meeting the expense of said Board; he giving bonds as the Board shall from time to time direct. The Board shall in its annual report to the Governor, and to the Michigan Pharmaceutical Association,

render an account of all moneys received and disbursed by them, pursuant to this act.

Sec. 10.—Any person not being a registered pharmacist, or having in his employ, a registered pharmacist, within the meaning of this act, who shall, three months after this act takes effect, keep a pharmacy, or a store for retailing or compounding medicines, or who shall display or exhibit his name upon the sign, card or label, of such store or pharmacy, shall be deemed guilty of a misdemeanor, and for every such offense shall be liable to a penalty of fifty dollars. Any proprietor of a pharmacy who shall permit the compounding and dispensing of prescriptions, or the vending of drugs, medicines or poisons in his store, or place of business, except by or under the supervision of a registered pharmacist, or a "registered assistant" pharmacist, or any pharmacist or "registered assistant," who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall wilfully make any false representation to procure registration, for himself or any other person, or shall violate any other provision of this act, shall for every such offense be liable to a penalty of fifty dollars: *Provided*, that nothing in this act shall apply to, or in any manner interfere with the business of any practitioner of medicine who does not keep open shop for the retailing, dispensing or compounding of medicines and poisons, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the making or vending of patent or proprietary medicines, or with the selling by any store, of copperas, borax, blue vitriol, saltpetre, sulphur, brimstone, licorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerine, glauber salts, epsom salts, cream tartar, bi-carbonate of soda; nor of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, sweet spirits of nitre, compound cathartic pills, quinine pills, and other similar preparations when compounded and put up in bottles or boxes bearing the label of a registered pharmacist or wholesale druggist, with the name of article and directions for its use on each bottle or box, nor with the exclusively wholesale business of any dealer.

SEC. 11.—No person shall add to or remove from any drug, medicine, chemical, pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value, or medicinal effect, or which shall alter the nature or composition of such drug, medicine, chemical or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or purity. Any person who shall thus wilfully adulterate or alter, or cause to be adulter-

ated or altered, or shall sell, or offer for sale, any such drug, medicine, chemical or pharmaceutical preparation, or any person who shall substitute, or cause to be substituted, one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. If convicted he shall be liable to all the costs of the action and all expenses incurred by the Board of Pharmacy in connection therewith, and for the first offense be liable to a fine of not less than fifty dollars nor more than one hundred dollars, and for each subsequent offense, a fine of not less than seventy-five dollars nor more than one hundred and fifty dollars. On complaint being entered, the Board of Pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulteration, substitution, or adulteration, and report upon the result of his investigation; and if said report justify such action, the Board shall duly cause the prosecution of the offender, as provided in this law.

SEC. 12.—Any registered pharmacist or assistant or licentiate in pharmacy, or other person who shall sell and deliver at retail, or give away any arsenic or its preparations, aconite, belladonna, biniodide of mercury, carbolic acid, chloral hydrate, chloroform, ether, conium, corrosive sublimate, creosote, croton oil, cyanide of potassium, digitalis, hydrocyanic acid, sulphuric, muriatic, nitric, or oxalic acid, laudanum, morphine, opium, nux vomica, oil bitter almonds, strychnine, sugar of lead, bichromate potash, white precipitate, red precipitate, arsenite of copper, or any other substance or liquid, usually denominated poisonous without the word *Poison*, and the true name thereof, and the name of some simple antidote if any is known, written or printed upon a label, attached to the vial, box, or parcel, containing the same, with the name and place of business of the seller, or who shall sell such poisonous substances to persons under the age of ten years, shall be deemed guilty of a misdemeanor, and the person or persons convicted thereof, shall upon such conviction be liable to a fine not exceeding fifty dollars. *Provided*, that nothing herein contained shall apply to the dispensing in physician's prescriptions of any of the poisons or articles aforesaid.

Sec. 13.—Any registered pharmaeist or assistant, or any other person who shall sell or deliver at retail or give away, any arsenic or its preparation.—atropia, corrosive sublimate, potassium cyanide, oil of tansy, or oil of bitter almonds, hydrocyanic acid, nux vomica, and its preparations especially strychnia opium and its preparations, especially morphine, except paregoric, and Bateman's drops and other preparations, containing less than 2 grains of opium to the ounce, without making or causing to be made in a book kep

for that purpose, an entry of the date of such sale, the amount and kind of poison sold, and the name of the person or persons to whom delivered, and their residence, and also for what purpose the poison is said to be wanted, which record shall be kept one year from date of last entry, and shall be open to the inspection of any police officer or physician during the business hours of the day, or who shall sell such poisonous substances to a child under ten years of age or who fails to satisfy himself that the poisons so purchased are to be used for legitimate purposes, shall be deemed guilty of a misdemeanor and the person or persons convicted thereof, shall upon conviction, be liable to a fine not exceeding fifty dollars: *Provided*, that nothing herein contained shall apply to the dispensing in physicians' prescriptions of any of the poisons or articles aforesaidand *Provided* further, that a record need not be made of any of the poisons above mentioned when sold to known practitioners of medicine and in the case of gum opium and morphine when sold to known habitual users of these drugs.

SEC. 14.—The giving of false or fictitious names to the registered pharmacist or assistant, or other persons from whom such poison is purchased, shall be deemed a misdemeanor, and the person or persons guilty thereof shall upon conviction be liable to a fine not exceeding fifty dollars.

SEC. 15.—All suits for the recovery of the several penalties prescribed in this act shall be prosecuted in the name of the "people of the State of Michigan" in any court having jurisdiction; and it shall be the duty of the prosecuting attorney of the county where such offense is committed, to prosecute all persons violating the provisions of this act, upon proper complaint being made. All penalties collected under the provisions of this act shall inure to the Library fund of the city, village or township in which the suit was prosecuted and judgment obtained.

SEC. 16.—All persons registered under this act shall be exempt and free from all jury duty in the State of Michigan.

SEC. 17.—All acts and parts of acts in conflict with the provisions of this act are hereby repealed.*

WM. B. WILSON,
H. J. BROWN,
C. P. PARKILL,
Committee.

*This is the amended draft of the pharmacy bill. The draft as presented by the committee was only changed in the wording of a few sentences and therefore I did not think it wise to publish both.

SECRETARY.

MR. BASSETT, of Detroit: I move that the report of the Com-

mittee on Legislation be received, and that it be taken up for discussion, section by section.

Mr. Brown, of Ann Arbor: Before that is done, would it not be wise to have the bill as reported by the committee printed, so the members can have the bill before them while it is under discussion.

MR. GUNDRUM, of Ionia: I think it would be much better to have the bill printed and to have it n the hands of the members when the matter is to be considered this evening. In that way it could be discussed intelligently. I would, therefore, move that the report of the committee, so far as it relates to the pharmacy bill, be printed, ready for distribution this evening. In the meantime we have papers which can be read, and in that way we can save time.

The motion of Mr. Gundrum was then put and carried.

On motion of Mr. Jesson, the legislative committee were authorized to have the bill as reported printed and ready for distribution at the evening session.

On motion of Mr. Bassett, of Detroit, Mr. Parker, of Detroit, was added to the legislative committee in order to facilitate the printing of the report.

THE PRESIDENT: The next business in order will be the reading of papers and the discussion of the same. Query 29, I understand, is ready to be reported by Mr. George. McDonald, of Kalamazoo. The query is, "Do preparations of aloes with bicarbonate of potassium or sodium lose medicinal power in losing their bitterness?"

The paper was then read by Mr. McDonald. (See subsequent pages.)

THE PRESIDENT: It is for the Association to decide what action it will take on these papers; whether they will discuss them now or wait until they are all read. I would like some expression from the meeting as to what course they think desirable to take.

MR. GUNDRUM, of Ionia: I move that the paper read by Mr. McDonald be accepted and placed upon the record and printed in the proceedings.

The motion prevailed.

THE PRESIDENT: The next paper in order was query 3, and a partial report on query 2, "What solid extracts are most favorable to preparation by the dispensing pharmacist?"

Mr. O. Eberbach, of Ann Arbor, submitted the following report:

In accepting query 2, my first impression was that the question could be answered upon general principles from past experience, but after beginning the examination it was apparent that the query could not be finally solved by a mere general view of it, and I would ask the Association to grant me one more year to investigate the matter. I think the only solution of the problem is to make a regular series of assays, and by a series of experiments.

Mr. Eberbach then read answer to query 3, "What solid extracts are most favorable to preparation by the dispensing pharmacist?" (See subsequent pages.)

THE PRESIDENT: I hope it is not the intention of the meeting to allow these papers to be disposed of by being printed in the proceedings. It would seem that they ought to excite a little discussion, but perhaps that will be the best disposition to make of them at present.

PROF. PRESCOTT: I think there is scarcely a paper that we have submitted that would not call forth considerable discussion, and very interesting and profitable discussion. On the other hand, I think we have not more than time enough for the reading of the papers and the disposition of the business before the meeting. We may have some spare time hereafter, and I think it would be better to have the papers read without discussion than to have a portion of them read and discussed, and a portion of them left without reading. I think we are doing as well as we can now, and though, perhaps, it is not the most agreeable or the most appropriate way, I think the best we can do is to have the papers all read and take them up for discussion if we have time. In order to save time I would move that all the papers read at this session, and at any subsequent session, be referred to the Secretary, and that they be subject to his revision and arrangement for publication.

Which motion prevailed.

Mr. H. J. Brown, of Ann Arbor, in reply to query 26, "To

what extent do the pharmacists of this State register the sale of poisons, and how far are they liable for failure to do so?" submitted his report. (See subsequent pages.)

A. B. Lyons, in response to query 31, "Reports upon any of the specific gravity tables of the pharmacoporia are desired," stated that it would be impossible, and perhaps out of place, to more than give an outline of the matter which he had brought together. The criticism of tables of this kind is dry work and requires a great deal of careful study of figures, unless you can have access to original authorities.

The report was then read, for which see subsequent pages.

Query 8, "Does the phosphoric acid of the market bear the pharmacopæial tests for strength and purity?" was answered by a paper prepared by Mr. Hugo Thum, of Grand Rapids. Owing to Mr. Thum's absence the paper was read by Prof. Wrampelmeier, of Ann Arbor. (See subsequent pages.)

Mr. A. L. Green, of Ann Arbor, read his answer to query No. 5, "Does the bromide of potassium in use answer to the tests of the pharmacopæia?" (See subsequent pages.)

In response to query 13, "Is black autimony still in use in dispensing pharmacy?" if so, what is its character? Mr. Geo. Gundrum of Ionia submitted a paper which caused considerable merriment among the members.. (See subsequent pages.)

MR. JESSON: It will require some work to examine the exhibits here present, and it is a matter which should be attended to. I therefore move that a committee of three be appointed to report upon the exhibits made at this meeting.

THE PRESIDENT: With the consent of the meeting I will decide that to be a question of privilege.

The motion was put and prevailed.

In response to query 12, "What are the highest percentages practicable for sulphurous acid in watery solution, what are the corresponding specific gravities and how can the solution be best preserved?" Mr. Charles Riebe submitted a paper, which in his absence was read by Mr. A. L. Green, of Ann Arbor. (See subsequent pages.)

In answer to query 9, "Reports on the collection of crude vegetable drugs from wild and cultivated plants in this State are desired" Mr. Perry read a paper, giving list of plants, etc. (See subsequent pages.)

The President announced the following as the Committee on Exhibits: Mr. Jacob Jesson, Mr. George McDonald, Mr. H. J. Brown.

Mr. L. T. White submitted a paper, on query 18, "Is the New Pharmacopoial process for the preparation of essential waters a satisfactory one?" (See subsequent pages.)

The President announced that query No. 7, "What is the purity and strength of the lactic acid in use?" would be replied to by A. B. Lyons, of Detroit.

MR. LYONS: I have only to say at present that I have not had the time to give the question the attention I should like to give it. I find the subject one that requires some study and my engagements have been such that I have neglected it.

MR. JESSON: I move that the general order be suspended for the purpose of allowing a report of the committee on President's Address to be given; which motion prevailed and the committee reported as follows:

Your committee to report on the President's message, respectfully submit that they heartily approve of the recommendations contained in that master-piece of literature and in accordance recommend that a committee be appointed to further the passage of a pharmacy bill through our next legislature; that a committee be appointed to see to the incorporation of our society; that a committee be appointed to frame a code of ethics to submit the same at our next annual meeting; that each member of this Association appoint himself a committee of one to confer with our respective congressional delegation in regard to abolishing or modifying the U. S. license law so far as it concerns druggists; that we recommend all members of this society to take a membership in the National Retail Druggists Association; that a full discussion may be had as to the relations between wholesale druggists, manufacturers of patent and non-secret medicines and the retail drug trade; that the thanks of this society are due to our President for the profound and scholarly way in which he has treated the affairs of this society. All of which is respectfully submitted.

J. C. MUELLER, ISAAC WATTS, C. P. PARKILL.

Committee.

On motion of Mr. Crouter the report of the committee was accepted and adopted.

Mr. George McDonald, of Kalamazoo, submitted his answer to query 21, "The mustard paper of the Pharmacopoeia, is the process a good one, and is it advisable for the dispensing pharmacist to prepare it?" (See subsequent pages.)

On motion of Mr. Jesson the rules were suspended for the purpose of allowing the names of the following applicants to be proposed for membership:

Thos. L. Blakely, Jones. Elmer G. Gleason, Richmond. I. D. Lane, Sand Beach. Wm. J. Roche, Meredith. John D. McKenna, " John Babington, Corunna. Frank G. L. Connell, Richfield Centre. D. A. Horner, Caro. John C. Harper, Milan. Wm. McFarland, Detroit. Carey H. Herrington, Belleville. Sylvester B. Shaw, Marlette. Leon C. Fink, Detroit. John G. Wiesinger, John C. Cahalan, Wyandotte. W. B. Porter, Detroit. Chas. A. Wright, Tecumseh. Otis C. Johnson, Ann Arbor.

The Executive Committee having reported favorably on their admission, on motion of Mr. Watts, the Secretary cast the ballot of the convention and they were elected.

Mr. L. Van den Belt, submitted a paper in answer to query No. 30: "How can Fluid Extract of Licorice be used the best to cover the taste of quinine?" He said, I thought it was needless to report fully the work done as it was entirely experimental, and some experiments were satisfactory while others did not give a satisfactory result. I selected the Fluid Extract which made the

best preparation for disguising the quinine, and have submitted it to the Association. (For paper see subsequent pages.)

Query 24 was answered by George Gundrum of Ionia, the query being, "What materials and manipulations are best for the turpentine emulsions?" (See subsequent pages.)

THE PRESIDENT: Are there any other queries that have been accepted.

PROF. PRESCOTT: Mr. President we have had reports upon 15 queries this morning and the remaining reports the parties desire to give this evening. If there were more time remaining this morning I think we could well spare it for the discussion. I should dislike to make any motion for discussion at this hour, however, as we have had such a long and patient hearing. I would say that we are to have this evening some very interesting and valuable reports, particularly a very useful report by our Secretary Mr. Jesson as well as by Mr. Stevens and others.

THE PRESIDENT: The next topic in order is Trade Interests. Mr. Brown, of Ann Arbor: I move that we now adjourn.

THE PRESIDENT: Before putting the motion to adjourn I would state that the committees on the recommendation of the President's address will be announced the first thing this evening. I trust there will be a full attendance as it is perhaps the only session we shall have for the discussion of important questions.

On motion the evening was set aside for discussion on the pharmacy bill.

The convention then adjourned until 7:30 P. M.

EVENING SESSION, 7:30 P. M.

The Association was called to order by the President, Mr. Frank Wells.

THE PRESIDENT: The hour has arrived for the consideration of the special order, the pharmacy bill. Pending the consideration of that bill, I will announce the following committees:

Committee to Procure the Passage of the Pharmacy Bill: George McDonald, of Kalamazoo, H. J. Brown, of Ann Arbor, F. M. Alsdorf, of Lansing.

Committee on Incorportation of Society: W. B. Wilson, of Muskegon, G. W. Crouter, Charlevoix, Frank Inglis, Detroit.

Committee on Ethics: A. W. Allen, Detroit, O. P. Safford, Flint, F. W. Fincher, Pentwater.

On motion, the reading of minutes of the last meeting was dispensed with.

The consideration of the pharmacy bill was then taken up.

Mr. Jesson: I would like to say something in regard to this bill. When in Milwaukee attending the meetings of the N. R. D. A. and the A. P. A., I made it my business to post myself on the workings of the different pharmacy laws. I conversed with members of pharmacy boards from Georgia, Ohio, Illinois, Iowa and Wisconsin. They all say that their laws are enforced and are quite satisfactory except in some minor points. Our Committee on Legislation has given a great deal of time and attention to this bill, and have as nearly a perfect bill as can be produced. If this bill, as here presented, can be made a law, we will have the least faulty and the strongest law in the country. A unanimous expression from this Association, representing as it does 450 drug firms in the state, that this, in the present form, is what we want, will have a good deal of weight before the legislature. It is very important to us to secure the passage of this bill. Self-preservation is one of nature's first laws. A member of the pharmacy board of an adjoining state recently said that out of 17 applicants for registration 4 passed. Now reflect for a moment! What does that mean? It simply means this, that those that are not qualified in other states are here, and until we can secure a pharmacy law, we must put up with having all that incompetent overflow thrust upon us, if we do not do as our neighbors have done, secure the enactment of a pharmacy law.

The Secretary then read the first section of the bill.

MR. WILSON: I move the adoption of Section one. Carried.

The Secretary then read Section 2.

On motion of Mr. Reasner Section 2 was adopted.

The Secretary then read Section 3.

On motion of Mr. Parkill, Section 3 was adopted.

MR. ALSDORF: It seems to me we are using proprietors with some partiality in the matter of time. We would be allowing registered assistance only 60 days while the proprietors are allowed

90 days. I move that line 6 Sec. 4, be amended so as to read within three months, instead of 60 days.

The amendment was adopted.

On motion of Mr. Brown, of Ann Arbor, Section 4 as amended was adopted.

The Secretary then read Section 5.

MR. REASNER: I move that Section 5 be adopted.

MR. ALSDORF: Do I understand that we are to recommend at this meeting 10 persons to act upon this board?

THE PRESIDENT: That cannot be done until the act is passed. A special meeting can be called for that purpose.

Section 5 was then adopted.

Section 6 was read by the Secretary.

On motion of Mr. Parkill, Section 6 was adopted.

Section 7 was then read by the Secretary.

MR. BASSETT, of Detroit: I move that so much of the section as applies to the moral character of the applicant be stricken out commencing at the word "and" after the word "registration" in the third line and strike out what follows down to the words and including the words "evidence of good moral character." I move that be stricken out.

MR. BROWN, of Ann Arbor: I would like to ask the gentleman's reasons for the omission, and if I may be allowed I will state that in examining the pharmacy laws of other states this bill is made identical with theirs. Suppose a young man should present himself for examination who is a drunkard, who has not a good moral character. I am, for one, opposed to his admission, and I oppose striking out that clause.

MR. BASSETT, of Detroit: I do not wish to arouse any controversy on the adoption of this bill, but I desire very earnestly to have a bill framed and adopted in the State of Michigan controlling this matter, and I desire to have this bill drawn in such shape that when we approach the legislature asking them to adopt it, it will do so. Now, sir, I do not believe in, and I should oppose this society setting itself up as a judge of the morals of the druggists of this state. We have nothing whatever to do, either as a board or as an association, with the moral character of any

man who sees fit to enter into business in this state. We have the right, if we can get the act passed, to see that they are qualified to execute the business which they propose to enter into, because it is a business which if not properly conducted may injure the lives of those requiring its service. But, sir, I claim we have no right to enter into the question of their moral character. If a man is not fitted morally for a pharmacist the people will soon find it out and desert him, but we have no right to set ourselves up as judges of men's moral character.

MR. SACKETT, of Monroe: If we are to have educated druggists and men qualified by culture, are we not at the same time bound to see to it that they are men of such character that we can trust them? It seems to me the matter hinges right here. A man fitted to come before the people as the assistant of a physician ought to have a character beyond question, and the very fact that he offers himself for that place ought to be evidence of that character. But we have the right to protect ourselves against him morally. It is the very thing we are aiming at. If a man is educated and a scoundrel, he is so much worse a scoundrel by the fact of his being an educated scoundrel. If he is fit so far as his head may be concerned and his heart is dirty and vile we don't want him. We have the right to put our foot on him.

MR. WATTS: In connection with the initiation of our organization last year we talked the matter very freely with the citizens of Lansing, those interested in legislative work. I have conversed with others in different parts of the state and the first remark was almost invariably, "what are you going to do with the standard of pharmacy?" What are you going to do to elevate your institution. or is it to be as it has been?" "If this is your purpose, if you come together as men to elevate the moral standard of those in the business, we are heartily with you, will assist you, heart and hand, in every way we can, and we as citizens have been wishing for a long time that something would be done among yourselves to elevate the standard of your profession. Gentlemen, this is the sentiment in this community, it is the sentiment throughout the length and breadth of this state, and this enthusiasm in pharmacy is measurably owing to that sentiment. It is a credit to the state, it is a credit to each one of us, it is a credit to us as men, because we desire to be higher, better, and consequently more useful. If there is to be no morality in this institution then we do not need it. Better not do anything. Better say we are something else than pharmacists, but in the name of humanity, in the name of our noble country and in the name of our state of which we are so proud, in the name of the mothers and children in this land who are looking to us for favorable attention, hoping to be made better in every way, looking to us for something better than the groveling state in which pharmacy has rested in the past, I insist to you we must have morality in it.

MR. REASNER: It seems to me that Section 2 of this act supposes every man in the drug business at the time of the passage of this bill may remain in the business. This section relates to persons admitted subsequently, and I apprehend that none of us would be quite willing to take a man into our employ who did not possess a good moral character. It does not apply to any druggist at present in the business, but applies to those who are coming into the Association and the business hereafter.

MR. BROWN: I think if this bill passes and a State Board of Pharmacy is organized, that the druggists of this state and of every other state have a right to expect that any young man holding a certificate has passed an examination before that Board and is worthy to be trusted.

I say for one that while I have the interests of this bill, as much at heart as anyone, I feel that I had rather see the bill defeated than to have a State Board of Pharmacy created which would pass a man without regard to his moral character.

MR. GUNDRUM, of Ionia: I think we can save the bill with that clause in. I know what it is to have persons who have no moral characters, for competitors.

MR. VERNOR, of Detroit: Who is to be the judge of this young man's moral character?

MR. Wilson, of Muskegon: He must present good evidence of that fact.

MR. VERNOR: There is not a young man in the state who cannot prove a good moral character.

MR. BASSETT, of Detroit: Mr. Vernor has hit the nail right square on the head. Now I trust that the gentlemen here will not think I am advocating the admission of immoral persons into the

drug business, but the question with me is who is going to be the judge of the moral character of the men who apply for examination? It is not necessarily confined to young men. We expect in the course of good time to have men from other states come here who will desire to enter into business. This bill in previous clauses has provided for that very contingency. If a man comes to this State Board and asks for a license to practice pharmacy he has got to prove good moral character, and he can easily get that evidence from those he has been associated with, but on the contrary they may send evidence damaging to that man. Now I claim we have no right to go into the question of a man's moral character. We have the right to insist that he shall conduct the business he goes into properly. We have no right to ask the legislature of this state to pass an act searching into men's moral characters, of men who desire to go into business in our state, either young or old.

MR. GUNDRUM: I should think our standing ought to be as good at least as the saloon business. It requires good moral men even to go into the saloon business.

MR. COLMAN, of Lansing: I would like to move an amendment; that the lack of good moral character in the applicant shall be just cause for the Board refusing a certificate.

Mr. Bassett: I would like to accept that amendment.

THE PRESIDENT: Your amendment was not supported.

MR. CROUTER, of Charlevoix: I do not see how this clause is going to defeat our bill. In all our state institutions, the State School of Pharmacy, for instance, requires a certificate of good moral character before the applicant can enter. If our state institutions require it now how is it going to hurt our bill to have this clause in it?

Mr. Alsdorf then moved the previous question which was carried.

THE PRESIDENT: There is already one motion before the house which has been put by the chair. Mr. Colman will reduce his amendment to writing.

MR. COLMAN: "Provided that proof of the lack of good moral character shall be sufficient cause for the refusal of a certificate."

MR. COLMAN: I do not agree with the gentleman who made the first motion, fully, that we have nothing whatever to do with

the moral character of the man who applies to be admitted to our profession; at the same time I do not believe in having this Board which is to decide this question, have too much to pass upon. agree with the gentleman to my left who insisted that men should furnish proof of good moral character, but he will find friends ready to furnish it; he will get recommendations from somebody and plenty of them, and the Board, unless they have some personal acquaintance with him, may never know anything about it. An applicant may come to this Board to be passed and, unless they know him personally, although his moral character may be bad, they will pass him. What constitutes a good moral character, or what constitutes an immoral character? One may say drunkenness, another selling whisky, another swearing, another cheating your customers by selling low grades of goods. It is almost as indefinite an expression as the word poison. Perhaps, if we are going to put it in as it was in the first place, it would be as well for us to specify what is or what is not good moral character. am aware at the same time that this must be left open somewhat; that he must pass a satisfactory examination, and if this is inserted they will also have to determine what is or is not good moral character; but I take it for granted in the first place that the man who offers himself to become a member of this Association is an honest, upright man, and, unless we hear something to the contrary, such must be his standing.

Mr. A. B. Lyons, of Detroit: This is a question upon which we all ought to have an opinion. To my mind the whole question turns on the point of what constitutes a good moral character. The state grants this man simply an opportunity to carry on business, and I do not see that legislation by the state can take cognizance of the moral character of the applicant. A course of education is required but I do not see how you can interfere with this other question. A man does not show his character in every case. A man that is a bad man does not proclaim his wickedness. The most immoral man you please may conceal his character, and the form that requires he should have a good moral character means nothing. The point in my judgment is that the state cannot legislate on such a matter as this.

MR. RAIDER, of Newaygo: I hope we shall insist upon a pro-

vision of this sort. I hope that we shall insist that any person in the habit of getting intoxicated shall not be premitted to dispense medicine in this state, any more than a physician should not be allowed to practice medicine while in that condition at any time. It has been referred to by some persons here that that was a part of the moral character referred to. Persons in the habit of using intoxicants immoderately should not be allowed in the profession. Without that provision if a man should pass a good examination and yet be an immoral man we have no way of keeping that man out. If we have not I sincerely hope that we will pass a law that will kick a man out if we get him in.

PROF. PRESCOTT: I may be in error in regard to what is customary under the law. A judge of one of our courts could certainly inform us better upon that point, but I am under the impression that it is common to regard the question of good moral character in the applicants for various positions and places of trust and for the various pursuits and callings of society under our state law. I know in any of the institutions of learning it is a common requirement and I never heard any objection raised against it except the objection that it was apt to be a dead letter. I never before have heard the objection urged against it that it went beyond the powers of the state to inquire into moral character. It is not a religious test at all. It makes no discrimination regarding religious opinion. It is true it is apt to be a dead letter, but it seems all we can urge against if is that it may be a dead letter, that it does no harm and does no good, that it is of no consequence at all. But I do not know that this requirement is always a dead letter. I am reminded at this moment of a bright young man who was for many years in the drug business and who spent one term at our school. He is now in destitute circumstances and is unable to obtain employment as an assistant pharmacist, just because he cannot obtain a letter certifying to his good moral character from any of his employers or from a school of pharmacy. One of his employers told me since I have been at this meeting, a pharmacist of Detroit, that he is a good competent man, bright, thoroughly well qualified, but that he could not certify to his moral character. Now it seems to me that a board might go so far as to require evidence of employers and evidence of institutions. To be sure

some man might get persons to certify that he had a good moral character, but a very little inquiry might satisfy the board that his character was not satisfactory. I confess, however, that in the majority the requirement would not amount to very much, yet it would have a good moral effect and it might deter some young men from going into the paths of dissipation which would wreck them morally.

THE PRESIDENT: The question is on the substitute.

Substitute lost.

The Section as then amended was adopted.

The Secretary then read Section 8.

Mr. Jesson moved that the Section be adopted.

MR. DAHM: In lines 4 and 5 I should like to see a correction made and have those lines read as follows: "Every person receiving a certificate under this act shall conspicuously expose the same in his place of business," substituting those words for lines four and five.

The substitute was then stated by the chair and was agreed to by the Association.

The Section as amended was then adopted.

Section 9 was then read by the Secretary.

On motion of Mr. Reasner, Section 9 as thus amended, was adopted.

The Secretary then read Section 10.

MR. WILSON: I move that the words "sixty days" in line two be stricken out and the words "three months" be inserted in place thereof, making it correspond with Section four and Section 2 of the bill.

The motion being put, the amendment prevailed.

The SECRETARY: I move to strike out "by any retail dealer" in the 15th line.

Mr. Alsdorf: I move we strike out the whole provision in that section commencing at the word "provided" in line 11 and what follows. I see there is a clause here relating to physicians which is better to leave in, but the balance should be stricken out.

MR. BROWN: We may say that country stores shall not sell poisons, but we may as well allow it and be generous. Country

stores are going to sell castor oil and sweet oil. It seems to me you are striking out too much.

MR. EBERBACH: I would suggest we be as lenient as possible for the purpose of having the bill passed.

MR: ALSDORF then withdrew his motion by consent.

THE PRESIDENT: The motion being withdrawn the question is on the striking out of the words "by any retail dealer" in fifteenth line.

MR. BASSETT: I move to strike out the words "provided there is no registered pharmacist within a distance of three miles" in the fifteenth and sixteenth lines.

The amendment was agreed to.

MR. VERNOR, of Detroit: There is a point that is a little blind in line 5. "Any registered pharmacist who shall permit the compounding and dispensing of prescriptions, or the vending of drugs, medicines or poisons in his store or place of business, except under the supervison of a registered pharmacist or except by a registered assistant pharmacist." What is to become of the young men that are growing up in the stores?

MR. WILSON: That is under the supervision of the pharmacist or registered assistant.

MR. ENGELHARD: I desire to say with reference to that particular clause that the proprietor of a pharmacy is not necessarily a registered pharmacist. This would exempt the proprietor from all liability, and it is the proprietor of a pharmacy who should be held chiefly responsible for an illegally conducted business. I would there suggest the substitution of the words "any proprietor of a pharmacy who shall permit the compounding of prescriptions &c".

Mr. Vernor moved that the words "registered pharmacist" be changed to "any proprietor of a pharmacy,"

The amendment was agreed to.

Mr. Wilson: I move that the word "and," after the words "bi-carbonate of soda" in the 16th line, be stricken out and a semi-colon and the word "nor" be inserted.

MR. KELLOGG: I move that this Section be amended so they shall be allowed to sell everything but poisons. That gives them the right to sell these things in any shape or form. In some of

these northern counties there are localities where there are no druggists, and they are compelled to sell these medicines. If you strike those out and limit them to selling poisons you reach the whole thing. Motion seconded.

MR. ENGELHARDT: May I be allowed to say how this clause originated in the first place? This is a copy, with the exception of the semi-colon and the words "nor and," of the Ohio law. There was a hard fight in the Ohio legislature over this clause. It was amended time and again, and there was every indication that the whole bill would fail for that reason. That amendment was defeated by a close vote, and it was only through the most herculean efforts that it was got through the general assembly in that shape. The point is to give the country druggist all possible rights and at the same time avoid injuring the health of the people. The legislature of this state will not, nor will the legislatures of any other states, regard the interests of druggists. It is in the interest of the people they consult, and the question with them is, how shall we protect the interest of the people? We do not care to protect the interests of druggists or of any class of traders. How can the public be protected, regardless of the privileges of any class of men? If the public can be protected by allowing country stores to sell things down to the word "paregoric," it would be certain they would approve it in that form. question would come whether they might sell paregoric and other articles. I think the legislature would endorse that. I think upon this very clause will arise the greatest difficulty before the legislature. Here is where the amendments will be made. Here is where the opposition will make itself felt, and I think, with the insertion of this word "nor," it will be impregnable.

MR. ALSDORF: I move that this Section be passed over and action be postponed upon it until to-morrow morning at 9 o'clock, and it then be taken up under the head of Unfinished Business.

Which motion prevailed.

The Secretary then read Section 11.

On motion of Mr. Alsdorf, Section 11 was adopted.

Section 12 was then read by the Secretary.

MR. BROWN: I move that the word "any" in the first line

of the Section be stricken out, and the word "every" inserted in the place thereof, which amendment was agreed to.

On motion of Mr. Jesson, the Section was adopted as amended. The Secretary then read Section 13.

MR. BASSETT: I move to strike out, commencing at the word "without" in the fifth line, all the following to the word "day" in the ninth line.

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MR. BROWN: The difference is simply this: the law as it now stands says all this in Section 12 shall be the law. As it now stands it requires that all poisons shall be registered. Our notion was to frame a law that should be obeyed by exempting eight or ten of the active poisons.

PROF. PRESCOTT: It is true that the law is nearly a dead letter, but it is also true that here and there it becomes a live letter to pharmacists. I presume I am called upon as often as any one in the state to give testimony in criminal poisoning cases, and almost every time there is a prosecution for criminal poisoning, it is shown the poison was procured at a drug store, either by evidence other than of the druggists, or by the evidence of the druggists themselves, and he is then asked, "Did you make a registry of the sale of this poison, or the name of the purchaser, and of the alleged purpose?" "No, I didn't." "Were you not aware that under the laws of this state you were liable to criminal prosecution for neglecting to do it?" He may say he is not aware of it; then they will tell him he is an exceedingly ignorant man. If he should say he was aware of it and say that it was not very generally done, they say that is a very poor excuse. Last fall a druggist, after taking counsel, declined to answer the questions because his answers might criminate himself. I do not think now there is one of those druggists who has had such an experience who does not keep a registry of his poisons. To be sure these cases do not very often occur; but when they do they are exceedingly perplexing to the pharmacist. This law is more practicable than the one we have and I think should be passed.

MR. Lyons, of Detroit: The great trouble now is if persons come to your store and you ask them these questions, they will find fault with you and say that no one else asks them these questions. When I came to Detroit I found this trouble to exist and I

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had to give it up. But if this act is passed and it comes to the public notice that trouble would be at an end.

Mr. Stevens, of Detroit, said if the existence and importance of such a law were more generally known, the registration of poisons would be more uniformly observed. As at present, few druggists trouble themselves about it, and their questions for this reason in contrast with the silence of the majority are apt to be regarded by purchasers as prompted by pure curiosity.

Mr. Gundrum said he once sold a poison without registering, and which resulted in the death of the person taking it. He had no trouble now in remembering the law.

MR. BASSETT: I will withdraw my motion.

Section 13, as amended, was then adopted.

The Secretary then read Section 14.

On motion of Mr. Jesson, the Section, as amended, was then adopted.

The Secretary then read Section 15, and on motion of Mr. Kellogg, it was adopted without amendment.

Section 16 was then read by the Secretary, and was adopted without amendment.

Section 17 was read and adopted without amendment.

On motion of Mr. Jesson, the rules were suspended to allow the presentation of names of applicants and for their reference to the Executive Committee, and the following names were presented:

U. D. Bristol, Lapeer.

F. E. Bristol,

James S. Vincent, Lapeer.

Ferris R. Fales, Vassar. F. F. W. Hogguer, Detroit.

Henry J. Fehlig, Jr., Belleville.

C. N. Miller, Dryden.

The Executive Committee reported favorably on the names of the applicants, and they were duly elected members of the Associ-

On motion, the Association adjourned until 9 o'clock to-morrow morning.

MORNING SESSION, SEPTEMBER 11, 1884.

The Association was called to order by the President, Mr. Frank Wells, at 9 o'clock A. M.

The President announced that the special order for the morning was the election of officers, and the hour has now arrived and nominations are in order.

MR. PARKILL: It seems to me that if there is wisdom in the old maxim to let well enough alone, there is additional wisdom in our saying we had better let first rate alone, so if it is in order I will nominate Mr. Frank Wells for President.

MR. Wells: While I appreciate the honor I certainly think it is to the interest of this Association to nominate some other person. It is an office in which there should be rotation, and one man ought not to accept such an honor for more than one year. I believe we have other persons who can fill the position much better than I can do, and although I have done everything possible within the last year to promote the interests of the society, I think the society should elect some other person. For these reasons I hope you will not select me for another term.

Mr. A. B. Stevens, of Detroit, nominated Mr. Brown, of Ann Arbor.

The Secretary spoke at some length with regard to the advisability of frequent changes in the officers of the Association, stating that he appreciated the value of the services rendered by Mr. Wells in the past.

Mr. Gundrum nominated Mr. George McDonald, of Kalamazoo. Mr. Watts nominated William Dupont, of Detroit.

MR. DUPONT, of Detroit: M1. President and gentlemen, I thank the gentleman from Grand Rapids very much for the compliment he has paid me; but it would be entirely impossible for me to accept any such position.

Mr. Allen nominated Mr. George W. Crouter, of Charlevoix, and the nomination was supported by Mr. Northrup.

On motion of Mr. Alsdorf, the chair appointed as tellers Mr. F. M. Alsdorf and Mr. A. B. Stevens.

Mr. Dupont nominated Mr. A. B. Stevens, of Detroit.

THE PRESIDENT: I would call the attention of the Association to the fact that the by-laws seem to be faulty in referring to elections. It states that they shall be elected by ballot, but does not state whether it shall be by a majority or a plurality.

On motion of Mr. Bassett it was decided that a majority of all the votes cast be necessary to an election.

The first ballot for President resulted as follows:

Whole No. of votes cast 67.

Necessary to a choice 34.

J. W. Crouter received 30.
H. J. Brown
Frank Wells
Geo. McDonald
Scattering
6.

There being no choice the President ordered another ballot, stating that he trusted his name would not be used for the reasons before stated.

The second ballot for President resulted as follows:

Whole number of votes cast 64.

Necessary to a choice 33, of which

J. W. Crouter received 38

H. J. Brown " 15 Frank Wells " 5 Scattering " 6

On motion of Mr. Brown, Mr. Crouter having received a majority of the votes cast, his election was declared unanimous. (Applause.)

Prof. Prescott moved that a committee of five be appointed upon nominations for the remaining officers, which motion prevailed.

The President then appointed the following committee on nominations: Mr. Prescott, Mr. Lyon, Mr. Gundrum, Mr. Watts, Mr. Eberbach.

On motion of Mr. Jesson the order of business was suspended in order to discuss Trade Interests while the committee on officers prepared their report.

Mr. Stevens: The subject of procuring members for the National Drug Association is one which we ought to consider. Through efforts that have been made here in the city of Detroit, we have secured about 50 members to the association. We have found, wherever the invitation has been extended there has been no difficulty in procuring members. The National Association needs that support, and I think it is the duty of every one of us to

support that association. The larger the membership the more force that association will have in approaching manufacturers of different preparations, and indirectly we shall have the amount we subscribed returned to us many times. We have blanks present for that purpose, and while other business is progressing we will pass around quietly to different persons and give all an opportunity to join.

THE PRESIDENT: I hope there is not a single member present who will leave the hall until he has become a member of the National Druggist's Association. It is of vital importance to our interests that that organization should be sustained. Those of you who have read their proceedings and are familiar with what they have accomplished, know if they can continue to do as much good in the next year as they have done in the last that it is worth many times the admission fee to every druggist in the state of Michigan.

MR. PARKER: I would like to hear from Mr. Perry. He has but recently returned from Milwaukee, and I think he can tell us something of the feeling among them regarding the interest western druggists take in the association.

Mr. Perry: I was very sorry not to see more Michigan men present at that meeting. Three fourths of the attendance was from the East. They are under the impression that western druggists did not know what it was to have prices cut, but that when the cutting of prices prevailed in the west to the extent it did in the east they would be out in full force. The membership is 2500 and three quarters of that number are eastern men. There cannot be too much stress laid upon this matter and I would recommend that as many join as possible.

Mr. JESSON: I move that a committee of three be appointed on resolutions in regard to Trade Interests and that they be instructed to report at their earliest convenience.

The motion was carried.

Mr. Bassett: It seems to me that a large amount of interest in regard to trade interests centres around this Campion plan. The Campion plan to me is somewhat indefinite, that is I do not understand it perfectly, and I have heard rumors that lead me to believe that it is to a great extent inoperative. I would like to move the resolution, without having the meeting understand it is

my idea at all but simply to bring the matter before the Association. Resolved; that the Campion plan is a failure.

THE PRESIDENT: The question is not supported.

Mr. BASSETT: My resolution is for the purpose of arousing discussion. I don't want it understood that that is my own opinion.

THE PRESIDENT: I will announce as the committee on resolutions on Trade Interests; Mr. H. J. Brown, Mr. J. C. Mueller and Mr. W. B. Wilson. If there is any gentleman present who can explain the Campion plan we should be pleased to have him do so.

Mr. Engelhard was then requested to state his information regarding the subject.

MR. ENGELHARD; I think the Campion plan is one that is easily comprehended and is simple in its provisions. It is one which is calculated to be effective, provided it secures the support of the retail druggists of the country. In brief, it provides an agreement on the part of the proprietor entering into the plan, that he will refuse to sell any of his goods to any wholesaler who will sell to any retailer who will sell at less than the regular list of dealers. It binds the wholesaler and retailer and all parties buying the goods of firms in this Campion plan, and those firms are required to maintain retail prices on penalty of being cut off from further supplies in case of violation. The enforcement of the plan comprises the organization of what is known as the Protective Association of America, consisting of three members of the National Druggists' Association, three of the Proprietors' Association, three of the Wholesale Druggists' Association, making an association of nine members from these three separate organizations. They have appointed a superintendent, with headquarters at Phaladelphia. Complaints can be made to the Chairman of the Executive Committee of the National Druggists' Association. They will be investigated, and it having been established that a retail dealer has cut prices, the proprietor will be informed of that fact, and he will then notify the superintendent, who will send out notices to all men dealing in patent medicines that hereafter they must refuse orders from such parties.

MR. BASSETT, of Detroit: This matter is very interesting to

I desire to obtain information as to the workings of the plan It strikes me that in small places where there are but two dealers who can be easily reached, it is a very easy matter to be enforced; but, for instance taking it here in the city of Detroit, let me ask you how you are going to control the dealers here. We have a large number of jobbing houses, and the dealer has a large number of friends. Suppose he is reported as cutting prices on certain articles—we will say Ayer's medicines. The officers of this organization notify him that he must quit cutting. They notify every member in this and adjacent cities that they must not sell to this man. It is no stretch of the imagination to say this plan has been tried in this city, and it is just as easy as it is for a man to turn over his hand for such a party to get such goods as he wants. he cannot buy them himself he has plenty of friends who can buy them for him and have them delivered at different places. It seems to me it is pretty hard to stop it, but if there is any means by which this can be done, I would like to have it plainly and thoroughly elucidated, so we can carry it out. I am thoroughly in favor of the Campion plan. I am as much opposed to cutting prices as any man in the trade. I most assuredly should like to see the plan carried out, if it is possible.

MR. A. B. LEE: I understand that each case of goods is marked and can be traced to the store from which it was sold, so that even if a friend did buy them of a house they could be traced by their book, just the same as Parke, Davis & Co. could trace goods of theirs. For instance, if a friend of mine should go to the wholesale house of Farrand, Williams & Co. and buy goods for me, there is a number on these goods by which they can be traced. In New York they have very much difficulty through buying goods by friends or agents.

MR. DUPONT: If our Local Secretary, Mr. Allen, was here, he could explain how the Campion plan has been worked to advantage in Detroit. He has a case on record where it worked most beautifully. The party said when he was refused the goods that he could get them in the neighboring cities, but in a few days he telephoned to Mr. Allen that he guessed he would adopt the Campion plan.

The committee on nominations announced they were ready to

report, and with the consent of the Association reported as follows:

For first Vice President, George McDonald, Kalamazoo;

- " second " " Burr D. Northrup, Lansing.
- "third " "Frank J. Wurzburg, Grand Rapids. For Secretary, Jacob Jesson, Muskegon.
 - " Treasurer, William Dupont, Detroit.

Executive committee, H. J. Brown, Ann Arbor; A. B. Stevens, Detroit; Geo. Gundrum, Ionia; W. H. Keeler, Saginaw; F. W. Fincher, Pentwater.

The report was accepted and the committee discharged.

On motion of Mr. Alsdorf the Secretary was instructed to cast the ballot of the convention for the officers and members of the Executive Committee reported by the committee on nominations.

THE SECRETARY: I most emphatically object, as you already know, to electing officers for a second term and I shall therefore object to my re-election as Secretary.

Mr. Jesson was ruled out of order and then cast the ballot of the Association for the election of the officers named, when the nominees were declared elected.

MR. STEVENS: I think the salary of our Secretary ought to be doubled.

MR. CROUTER: As a member of the last Executive Committee we went over the accounts of the Secretary, and we found the Secretary had a vast amount of work to do the last year, and I think the Executive Committee are unanimously in favor of increasing Mr. Jesson's salary to at least \$150 per year.

I therefore move that the salary of the Secretary for ,the coming year be fixed at \$150.

Mr. Watts amended by making the amount \$200. The amendment prevailed and the motion as amended, carried. (Applause)

The Committee on Resolutions in regard to Trade Interests announced that it was ready to report, and made the following report through Mr. Brown:

The committee has very hastily drafted two or three resolutions which we intend shall excite discussion.

Resolved: That the members of the Michigan State Pharma-

ceutical Association condemn the soliciting by manufacturers of nonsecret medicines or orders from other dealers than druggists.

Resolved: That the members of this Association will not favor such jobbers or manufacturing firms as may practice the solicitation of orders from an analysis and a husisians

tion of orders from consumers and physicians.

Resolved: That we consider the Campion plan the best one yet devised for the protection of retail druggists in the matter of cutting prices on proprietary articles.

Mr. Brown stated further that the resolutions were reported rather for the purpose of exciting discussion and not as an expression of the private views of the members of the committee.

Mr. Vernor moved that the resolutions be laid upon the table.

Mr. Dupont moved as a substitute their adoption.

Mr. Mueller moved to amend by adding after the words "nonsecret preparations" the words, "and manufacturers of patent medicines," which amendment was adopted, as was also the substitute of Mr. Dupont.

Mr. Brown moved that a committee of two be appointed to conduct the newly elected President to the chair.

The motion prevailed and the chair appointed as such committee Mr. Brown and Mr. Lyons.

The President, Mr. Crouter, on being conducted to the chair addressed the Association as follows:

Gentlemen of the Association, I thank you most heartily for this unexpected favor which you have conferred upon me. While I have misgivings as to the wisdom of your choice, I will assume the responsibility you have cast upon me and devote to the work my earnest endeavors. During the coming year I hope with your assistance that the Association will flourish as well as it has in the past. The hour is late and I think the best we can do is to devote ourselves to the business in hand and conclude our labors.

THE PRESIDENT: I would suggest that the Committee on Nominations should report names for delegates to the different associations.

MR. WATTS: That matter was discussed in the committee and it was thought advisable that the Association should choose them.

Mr. Gundrum: We thought it was taking the matter out of

the hands of the Association where it properly belonged, and that was the reason we did not act upon them.

PROF. PRESCOTT: Furthermore the acquaintance of the committee is somewhat limited on account of the large new membership, and a better regard for the different sections of the state might be had by leaving those nominations to be made by the Association.

THE PRESIDENT: You will proceed to elect your delegates to the American Association. There are five delegates and five alternates to be elected.

Mr. PARKER: I move that the rules be suspended and that we proceed to the election of delegates by acclamation.

The motion prevailed and the rules were suspended.

The meeting then proceeded to the election of delegates to the A. P. A. and N. R. D. A. with the following result:

Delegates to the A. P. A.—A. B. Stevens, Detroit; A. B. Prescott, Ann Arbor; A. B. Lyons, Detroit; Geo. McDonald, Kalamazoo; H. J. Brown, Ann Arbor.

The following were chosen alternates—Geo. Gundrum, Ionia; O. Eberbach, Ann Arbor; H. G. Colman, Kalamazoo; Frank Inglis, Detroit; Jas. Vernor, Detroit.

Delegates to N. R. D. A.—A. Bassett, Detroit; J. H. Kellogg, East Saginaw; Jacob Jesson, Muskegon; F. W. R. Perry, Detroit; Isaac Watts, Grand Rapids.

Alternates—John B. Watson, Coopersville; C. A. Fellows, Big Rapids; C. J. Stone, Detroit; H. J. Harvey, Detroit; Burr D. Northrup, Lansing.

On motion of Mr. Brown the Association resumed the consideration of Section 10 of the Pharmacy Bill.

Mr. Alsdorf: This says they shall not interfere with the making or vending of non-secret medicines.

Mr. VERNOR: I move to amend the section by striking out the words "by a registered pharmacist" in line 21. Also by striking out the word "such" in line 22 and inserting the letter "a" in place thereof.

The amendments prevailed.

Mr. EBERBACH: It seems to me that this section is one of the most important in the whole bill. We are trying to draw a line

between Galenical articles and articles of commerce. I think all goods like hive syrup, ipecac, etc., are perfectly safe, but I do not think any one here will contend they are pharmaceutical matters only. If we, as registered pharmacists, expect to derive any benefit from this bill in the way of legislation I think we should draw the line there as lightly as possible. I think this clause can be so modified that it will be clear to the representatives and that it will pass. If we strike off the bottom section we might as well throw open the door and let them sell fluid extracts and tinctures. Why not divide the section into three different parts?

MR. Kelloge: Most stores desiring to keep that class of goods do not care about keeping a class of goods they know nothing about, and with the exception of tincture of arnica and perhaps number six, they don't care about having them. I have been a good deal among the people in the northern part of the state, and I know the country stores feel that if they enter into a general line of drugs they will be compelled to keep some one to handle them, because they know nothing about them.

MR. GUNDRUM: I think it would greatly simplify the bill and there would be less objection to it if the word "poison" were substituted for the whole list here given. It would give a greater latitude and cover all things you attempt to cover by "similar preparations." For one I am in favor of giving all latitude possible, and I think the word "poison" would cause less objection to the passage of the bill than to name these articles under the head of "similar preparations."

MR. LYONS: "A half loaf is better than no bread." There is danger, if we attempt to amend this section too much, that those wise legislators at Lansing will throw it out entirely. Isn't it better to leave the matter as broad as may be with some such statement as this; say that this shall not interfere with the making or vending or selling of common domestic remedies, exclusive of those commonly recognized as poisons; and leave it at that. If they chose to substitute a list like this, which seems to be a matter of some doubt, let them do it.

MR. Brown: Mr. Engelhard can explain to us again the

trouble they had in the passage of this bill in Ohio. I wish he would do so.

MR. ENGELHARD: I would state that the laws of Illinois, Iowa and Wisconsin have inserted in them the words "nor with the sale of ordinary domestic remedies by retail dealers." Some of the laws add another clause to that. That clause was presented to the Ohio legislature at its last session, and they proceeded with the discussion of the bill in the assembly first and got along very nicely until they struck that section. When they struck the clause "nor with the sale of ordinary domestic remedies," a member immediately inquired, what do you mean by "ordinary domestic remedies?" and the friends of the bill were unable to answer. The bill was not adopted in that form. After it went to the senate of the Ohio legislature, the senate looked at the clause and decided to incorporate a clause something of this character—not exactly like this, but very nearly—and they adopted it and sent that amendment to the house. The house refused to concur in the amendment as drawn by the senate and sent it back to the senate, and it oscillated between one house and the other until it resulted in a conference committee, and this is the result of that special conference committee of those two houses of the Ohio legislature. I will state that that clause is stronger than any other clause to my knowledge, for the simple reason that it gives to the general dealers only a few articles for sale. For this reason I think it is much stronger than others.

MR. Wells: I would move that all be stricken from the latter part of this section beginning with, "when compounded by a registered pharmacist" in line 21; that all the balance of the section be stricken out. I make the motion for this reason; in going before the legislature and arguing for the bill they will naturally say that portion of the section has been framed for the purpose of benefiting dealers in drugs, and it will therefore, in my opinion, defeat its passage. I think it amounts to little, if anything, and might on general principles be stricken out.

MR. Kellogg: I made the motion that all be stricken out from the 15th line, and the word "poison" inserted, and the motion was seconded.

MR. BASSETT: I am very deeply interested in this Pharmacy

Bill. It seems to me this question reduces to this: whether we get a bill at all or not. Legislation has been repeatedly attempted in regard to this matter, and invariably when we come to the legislature they strike out this clause, and that kills the bill. not try and get a bill that will be passed? I do not think this stringent bill can be got through. I think we can get through a law for the registration of pharmacists, and that is the entering wedge; after we get that through we can put this into it. I think if you will strike out the whole of this section pertaining to those articles from line 15 you will cover the ground. islators were elected from the large cities we could pass a bill of this kind, but the country members invariably predominate. large number of these men are lumbermen and men interested in country stores that carry this kind of goods, and you cannot get them to pass a bill that will restrict their sales. If we get a bill for the registration of pharmacists that will cover no more than the dispensing of physician's restrictions, and we can add to it as we see fit and are able to do so.

Mr. Kellogg's amendment was then carried.

MR. Wells, for the purpose of introducing a resolution: I move a suspension of the rules.

The motion prevailed.

MR. WELLS: I wish to introduce the following resolution:

Resolved, That the right hearty welcome extended to this Association by our friends, the wholesale and retail druggists and dealers of Detroit, is beyond all praise. Nothing to promote our social enjoyment seems to have been forgotten, and we tender to those gentlemen, one and all, our most sincere thanks.

I move the adoption of the resolution.

The resolution was adopted by a rising vote.

The Association then returned to the consideration of the tenth Section of the Pharmacy Bill.

Mr. Jesson moved the re-consideration of the vote on the Kellogg amendment, and stated that the special committee to whom this bill will be committed will necessarily be instructed by this Association to make such minor changes in the bill as may be necessary to have it passed by the legislature, believing that the bill, if so amended, would fail to command the support of the druggists

of the state. The motion was seconded by Mr. Alsdorf.

MR. ENGELHARD: I was elected an honorary member of this Association last year and therefore I may be pardoned for speaking oftener than would be proper under ordinary circumstances. I deem this the vital portion of the bill and any fundamental mistake made here may be of importance. The effect of this amendment would be to restrict the provisions of this act entirely to the sale of poisons. Now, whatever the purpose of this amendment is, it can be nothing more than to make this clause more specific. If that is not the purpose I think it has no reason for existence, for proposition. The proposition is to except patent and proprietary medicines, medicines supplied by physicians to patients and all others except poisons. It confines the provisions of the bill to that one single kind of medicine, poison, and it is as indefinite as before. I would call on Prof. Prescott, who is an authority on this question, to state what, provided the questions were asked in the legislature what is a poison, would be his answer. A friend of this bill will say to the legislature, we ask you to restrict the provisions of this bill and we mean only poisons. Then the question will be asked of the friend of the bill, "what do you mean by poison?" and suppose we have as able a man in the legislature as Prof. Prescott and that question is asked of him, I would like to know what kind of a reply he would make. Will Prof. Prescott please reply?

PROF. PRESCOTT: Let me state that the definition of poison in its application becomes somewhat indefinite. The definition I usually give is any article which, by absorption into the system or by chemical action upon its tissues, tends to produce death. It could be interpreted to mean many articles. A list of poisons in the sense of pharmacy is usually made restrictive. I suppose it could be applied very strongly regarding pharmacy. With the precedent of English law and the list of poisons in Great Britain, I think we would have a precedent of importance. That is not a very extensive list, and yet it must be said that no one can keep anything like a drug store without keeping poison. In strict construction paregoric is not a poison because the degree of concentration would enter into the definition of a poison.

MR. ENGELHARD: I then add that definition of this would in-

clude certain restrictions that are not desired and therefore would have a nullifying effect. I think if the provisions of this bill were restricted entirely to poisons you will not have a bill that will be effective. I recognize the importance of framing the bill in a spirit of liberality to secure the support of the people's representatives; but there is another element as strong and that is human concentration of purpose. These men are men who will bring concentrative efforts to bear on the legislature, and the influence of 1,500 druggists in Michigan will probably be as powerful an influence as all other citizens in the state combined. Let them go before the legislature with a bill framed on this principle and say "Gentlemen, we do not ask protection for ourselves, but we do demand in the interests of public health, in the interests of the lives of the people, the passage of a law which will prevent any body of men from disgracing our profession and trading upon the lives and health of the people. And that is the basis upon which our whole demand is laid-protection to the lives and health of the people. Now, gentlemen, to the extent that is necessary we ask you to pass the bill, providing that no man who is incompetent to put up a prescription, no man who is unable to tell a poison from an inert substance shall dispense medicine and thereby perhaps cause the death of a human being. We ask protection to the lives of the people and we put it on that basis alone—no protection to ourselves alone, but to the people." And that is the cry that will win with the legislature. There is one other thing, if you ask less than you expect to receive you will probably receive very much less indeed. That, I think, is almost an universal maxim in legislation. This bill has been enacted by a legislature just as critical, just as iron-clad in its object to protect country stores as any legislature, and it was adopted by a three-fourths majority of the Ohio legislature. Why should Michigan expect to defeat a bill of that kind? Furthermore we say to them if you recognize in it any injustice, modify it, but we propose to make it broad enough to protect the people, to protect the honor and protect the reputation of the pharmacists in this state.

MR. BROWN: So far as these country stores are concerned and the interest that legislators have in them, I am inclined to think they will fight this bill vigorously or any bill that does not allow them to sell laudanum or morphine by the bottle. They sell those things commonly in little country stores. Within a few miles of the city in which I live they sell morphine by the bottle and quinine and anything of the kind.

THE PRESIDENT: I am inclined to think we may as well ask for the whole thing. I think the remarks of Mr. Engelhard justify us in so doing. Are you ready for the question?

The chair then put the amendment to strike out all the words following the words indicated in line 15, and the amendment was lost.

Mr. Wells: I move that we reconsider the vote by which this section was amended striking out all after certain words in line 15 and leaving the section just as it was before the vote was passed.

Mr. Wells' amendment was put and carried.

Mr. Wells: I now move the adoption of the section as it stands, which motion was put to a vote and carried.

The question then arose as to the adoption of the whole bill, and upon being put to a vote the bill as amended was adopted.

On motion the bill was referred to the committee on Pharmacy Bill, with power to make such changes in the same as may become necessary to make the same a law.

Mr. Wells: I move that the Committee on Ethics be given until our next annual meeting to make their report.

The motion was carried.

Mr. Wells: I move that the Committee on Incorporation be instructed to procure the incorporation of this Association under the general laws of this state as soon as convenient.

The motion being put to a vote it prevailed.

On motion of Mr. Jesson it was agreed that when the Association adjourn that it adjourn to meet at 2 o'clock this afternoon.

The President then announced the following committees: Committee on Trade Interests—John J. Dodds, Detroit; H. G. Colman, Kalamazoo; S. E. Parkill, Owosso.

Committee on Pharmacy and Queries: A. B. Prescott, of Ann Arbor; A. B. Lyons of Detroit; O. Eberbach, Ann Arbor.

THE PRESIDENT: I will not announce the Committee on Legislation until the afternoon session.

Attention was called by the local committee on entertainment to the fact that the menu card of cork used at the banquet had been donated by T. H. Hinchman & Sons, and that the matter deserved special mention.

Mr. Wells: I move that when this Association adjourns finally, it shall adjourn to meet in the city of Detroit on the first Tuesday of October, 1885.

Mr. ALSDORF: I move to amend by making it the second Tuesday in October, for the reason the country fairs are held, many of them early in October.

Mr. Brown: While I regard Detroit on most accounts the most available place to meet, it does seem to me it is asking too much of Detroit to afflict her with two meetings for two years in succession. I for one am opposed to subjecting the Detroit druggists to the inconvenience of having a meeting again held here soon. It is a convenient point and probably the best point, but it seems to me there are some things to be thought of aside from that. Might it not be better to go to Grand Rapids or to some other part of the state? I simply offer it as a suggestion.

Mr. Wells: I think the convenience of the Association is the only thing to be considered. I was intending to make another motion if this passed, to the effect that the Executive Committee should be bound to bear all expenses including the social expenses. I do not think it is right that this Association which is able to pay its own expenses should expect the druggists of Detroit would bear the expense for them.

Mr. VERNOR: Do not let the annoyance of expense deter you from meeting here again. If it is agreeable to the convenience of the Association to meet in Detroit, we should be glad to have it meet here.

Mr. Allen, of Detroit: I would also say it is the sentiment of the wholesale druggists that the Association should meet here. As far as the expenses are concerned the retail dealers will have sold a few pills and we will be ready for you again.

Mr. Bassett: We should feel very much hurt indeed if you went away from here thinking we have been to trouble and ex-

pense to entertain you. We desire you all to feel that it has been a pleasure to us and we should be glad to extend the same courtesies again to you.

PROF. PRESCOTT: I am sure we all feel that this expression has been a spontaneous one, one that has given to Detroit more pleasure than to the Association if possible. At the same time the Association must feel a little hesitation in inviting itself here again. I think we must discuss this motion as connected somewhat with the subject which Mr. Wells has mentioned is to be brought forward in another motion. As regards the expenses of the Association, if this Association goes to some smaller town, certainly it would be necessary that it shall in a certain sense bear its own ex-That can be done by drawing not altogether upon the funds of the Association, but by allowing each of you to pay your own expenses, in the matter of the social features. idea is and I suppose we all believe that the Association should meet at Detroit often at least. It will be a benefit to the membership if the Association should meet in the interior and western part of the state. Whether it is ready to do so at present or not I cannot say.

MR. PARKER: It seems to me regard should be had for the increase of membership and that for another year you should consider Detroit the place of meeting. Another consideration is that it will attract eastern exhibitors and taking it all together I think Detroit should be the place of meeting.

The motion being put to a vote, prevailed.

MR. WELLS: I move that the Executive Committee be instructed to pay all expenses incident to our meeting; that all of the social part of our entertainment be conducted by the Executive Committee. In this way a member desiring to attend banquets or boat rides or any other special feature of the entertainment can bear his proportion.

The motion being put was lost.

MR. PARKER, of Detroit: I would like to propose the name of H. B. Parsons, of New York, editor of the Druggists Circular, as an honorary member of this Association. Mr. Parsons is a Michigan man, his interests are here, he was educated in Michigan, has

occupied many prominent positions, and he is a credit to our society and to the state.

The motion was put and prevailed.

MR. Wells: I am not altogether satisfied with the way in which this matter stands at present. I will now move that any special features of social enjoyment that are necessary to the meetings of this Association shall be borne by the Association or by the individual members.

MR. STEVENS: As far as the retailers are concerned we have not paid as much for the entertainment as the other members have to come here, so I think you had better let the matter remain as it is.

The motion was put and lost.

MR. Wells: I nominate for local secretary a gentleman whose name you will be surprised to hear, but still I am going to name him at the risk of your displeasure. I nominate Mr. Allen, of Detroit.

The motion was carried with every manifestation of approval. The Sercetary stated to the Association that he had received a telegram from the Secretary of the State Pharmaceutical Association of Ohio, congratulating this Association on its pleasant and profitable meeting and expressing belief in its future success.

Mr. Alsdorf moved that the salary of Mr. Allen be fixed at \$5,000 annually. (Laughter.)

On motion the Association adjourned until 2 o'clock, p. m.

AFTERNOON SESSION.

At 2 o'clock p. m. the Association was called to order by the President, Mr. Crouter, who announced the following as members of the Legislative Committee for the following year: Mr. I. Le-Roy H. Dodd, of Buchanan; Mr. W. B. Wilson, of Muskegon; Mr. G. L. Davis, of Lansing.

The Committee on Exhibits then made their report, which was adopted.

MR. PRESIDENT AND GENTLEMEN OF THE MICHIGAN STATE PHARMACEUTICAL ASSOCIATION: Your Committee would respectfully report that after a careful inspection of the exhibits of the various firms represented here, they believe that the Michigan

State Pharmaceutical Association have reason to take a great deal of pride in the character of this exhibit. We are informed that in extent and variety it is fully equal to the exhibits made at the meetings of other state associations, and in some respects superior. The examination of this exhibit has been to your Committee and, without doubt, to all of us not only a source of great pleasure, but in many of its departments one of profit and instruction as well. We suggest that a vote of thanks be tendered to these exhibitors, who have, in many instances at great expense, done so much towards contributing to the pleasure and interest of our meeting. The greater portion of the exhibits were disposed in groups in the rear part of the hall in which the meeting was held. Owing, however, to the inadequate size of the hall, some of the exhibits had to be displayed in adjoining rooms in the same building.

The following is a list of the exhibits, in the order in which they came under the eye of the Committee:

Whitall, Tatum & Co. made a fine display of their manufactures, including druggists' shelfware, perfumers' ware, graduates of warranted accuracy, lettered prescription ware, chemical apparatus of all kinds, nursery appliances, syringes and imported novelties in glassware. A glass ointment jar of their own manufacture, with raised glass letters blown on, and which are impervious to fatty substances, were worthy of special notice. They also exhibited some fine prescription scales, which were said to have unusual merit in point of delicacy and durability.

Richard R. Lansing made a display of the well known "Lansing mica labels."

The Seely Manufacturing Co., of Detroit, who also have branches in New York and San Francisco, made a large and attractive display of both bulk and bottled perfumes and toilet requisites. They also made a very interesting exhibit of crude materials used in the perfumers' art, noticeable among which were genuine tonquin musk and otto of rose in original packages, ambergris, vanilla beans, vitivert root and a magnificent specimen of the choicest gum benzoin.

The Detroit Stamping Co. displayed tin measures, scoops, funnels, water-tanks, pressed tin boxes, etc., of their own manufacture. Frederick Stearns & Co. made a very handsome display of their

pharmaceutical products, including fluid extracts, pills, lozenges, elixirs, pure powdered drugs, etc. Also a very interesting and instructive display of new and rare crude drugs. They also exhibited a line of the principal "non-secret" remedies, in the manufacture of which they are so largely interested and the original introduction of which they claim to be their own "new idea."

L. Black & Co., of Detroit, made an interesting display of microscopes, microscopical accessories, artificial eves, etc.

Seabury & Johnson made a very full display of everything in the line of medical plasters. Their display of lint of their own manufacture (and of which industry they are the pioneers in America) absorbent cotton and antiseptic preparations was also very fine.

Milburn & Williamson, of Detroit, made a fine display of surgical instruments, medicine cases and electro-medical apparatus.

Dean, Foster & Dawley, of Boston and Chicago, exhibited a line of prescription ware, odd designs in perfume bottles and druggists' sundries. Their display of fine cut-glass bottles was worthy of special notice.

Glover & Nicol, of Detroit, made a large display of fluid extracts, pharmaceutical preparations, perfumes in bulk and bottled; also ether, ammonia and sweet spirits nitre, all of their own manufacture. We understand that this is the only firm in Michigan who manufacture ether, ammonia and spirits nitre.

The Cheesebrough Manufacturing Co. made a display of their well known vaseline preparations, among which were a line of ointments of the Pharmacopæia, said to be more stable than when made with wax and animal fats, as directed by the Pharmacopæia; also petrolatum U. S. P. of two melting points, viz: 104° F. and 120° F. One of their novelties, a cosmetic in a sliding metallic case, promises, on account of its cleanliness and handiness, to have a large sale.

T. W. Heinemann, of Chicago, made a large display of Isinglass plasters in every conceivable style; also a large line of suspensories, shoulder braces, chest protectors and surgical appliances. In the line of court plasters, chest protectors and suspensories he ranks with the largest houses in the country.

The Florentine Perfume Co., of Chicago, made a handsome dis-

play of their popular perfumes in a great variety of tasteful styles.

Allan B. Wrisley displayed an elegant line of fine toilet soaps.

The Irondoquoit Wine Co., of Rochester, N. Y., exhibited pure domestic liquors of their own manufacture, consisting of port, cherry and Catawba wines and grape brandy, all of which are said to have attained the ripe old age of seven years before being placed upon the market. Also a cluster of the Oporto grape from which their port wine is made. We learn that not a few displayed a ready willingness to sample their wares.

Parke, Davis & Co. made an elegant and imposing display of their pharmaceutical products, prominent among which were their elegant "soluble elastic capsules," which make the taking of nauseous medicines a pleasure rather than a dread, oleates, normal liquids, empty capsules and menthol pencils; also a fine collection of new and rare drugs, which attracted much attention.

Eastman & Brother made an elegant display of fine toilet soaps, perfumes and odor cases, all of which they claim to sell to druggists only. An immense cake of fine toilet soap, imprinted with their trade-mark, attracted considerable attention.

H. F. Miller, of Baltimore, exhibited their specialties in druggists' seamless tin-ware in great variety.

The Sparrow Kneader and Mixer Co. exhibited their "centrifugal" mixer, a very useful article for mixing powders and making emulsions.

The Sprudel Water Co., of Mt. Clemens, Mich., were on hand with what seemed to be an unlimited supply of their bottled sprudel water, which they dispensed freely to all who wished to drink, and their name was legion. Judging from the continuous demands made upon them, this water must have other good qualties than those purely medicinal. There can be but little doubt that the free use made of this sparkling and delicious water contributed in no small degree to the grand success of the Association's meeting.

Yeager & Heath, of Knoxville, Tenn., exhibited a line of their patent improved oil cans for druggists' use,—a very handy device for the cleanly dispensing of oils &c.

Lazell, Marsh & Gardiner, of New York, displayed a very large line of odor cases, and perfumes, in a great variety of handsome and novel designs.

Powers & Weightman made an interesting and attractive exhibit of chemicals of their own manufacture, prominent among which were the salts of the Cinchona alkaloids, morphia, codeia in large crystals, caffein in large blocks and scaled preparations of irons.

John Wyeth & Brother, of Philadelphia, made a handsome exhibit of their well known pharmaceutical preparations and specialties. They exhibited, as a matter of interest to Michigan pharmacists, a beautiful specimen of "pipmenthol" crystals manufactured in this state from Michigan oil of peppermint.

McKesson & Robbins displayed a line of their Gelatine—coated pills, fluid extracts, elixirs, syrups and pure fruit juices for the soda fountain; also five grades of rhubarb in various forms, samples of sulphates of quinia and cinchonidia of their own manufacture, sulphate of morphia and vanilline crystals.

Mr. H. Schieffelin & Co. exhibited gelatine coated pills, fluid extracts and other pharmaceutical preparations of their own manufacture, including scaled salts of iron and Gardiner's chemically pure syrup of the Hypophosphites.

John Phillips & Co., of Detroit, made a display of show cases, in a variety of styles.

Charles Wright & Co., of Detroit, had an extensive exhibit of fluid extracts, elixirs and other pharmaceutical preparations which they manufacture largely, also a fine line of druggists' sundries. The department, however, to which this house pays most attention is that of "non-secrets," of which they make a large display in attractive styles, and in which line they say their business is rapidly increasing.

The Central Oil Co., of Detroit, exhibit lubricating oils of all grades, and for all purposes.

JACOB JESSON,
GEO. McDonald,
H. J. Brown.

PROF. PRESCOTT: I would say in explanation of our situation that some important papers at the request of their authors were left over from yesterday forenoon until last evening. We did not reach the papers last evening and they are now unfortunately left

to be read to a very small audience. We are to have a paper from Mr. Jesson in answer to Query 27.

Mr. Jesson then read the reply to Query Twenty-seven, "How far is it expedient for pharmacists to manufacture their own perfume, and what formulae can be proposed for the preparation of these articles," and submitted a number of samples of perfumes made from the formulae given. (See subsequent pages.)

In answer to query 28, "What is the morphine strength of the crude and powdered opium in use in this state?" Mr. A. B. Stevens read a paper. (See subsequent pages.)

Mr. A. B. Lyons presented a volunteer paper on sulphates of the cinchona alkaloids, which was accepted and ordered printed in the proceedings. (See subsequent pages.)

On motion a vote of thanks was extended to Mr. G. P. Engelhard for the lively interest manifested by him in the welfare of this Association and for the faithful report of its last meeting published in the Druggist and mailed to the members of this Association.

A vote of thanks was also given to the exhibitors at this session of the Association for the fine display made by them, thus adding to the attractiveness of the sessions.

Mr. Watts, of Grand Rapids, moved that a vote of thanks be extended to the railroad companies and to the press of Detroit for courtesies extended; which was carried.

The rules were again suspended to allow presentation of the names of applicants, and the following names were proposed for membership and referred to the Executive Committee for action: James L. Hogle, Farmington; Bowman C. Shaw, Clare.

The Executive Committee reported favorably upon the same and the applicants were duly elected by the Secretary casting the ballot of the Association.

Mr. Alsdorf moved that, in recognition of the valuable services of Prof. Prescott, he be made a life member of the committee on pharmacy and queries. Reference to the constitution showing this procedure to be illegal, the motion was changed to one of earnest thanks.

Prof. Prescott said he appreciated the motion, but it was unnecessary as a stimulus to further endeavors, for, being a working

man, he could ask no greater pleasure than to be able to work as long as he lives. (Applause.)

On motion of Mr. Wells the Executive Committee was empowered, in the event of the passage of the pharmacy bill, to submit, on behalf of the Association, ten nominees for presentation to the Governor, from whom to select a board of pharmacy.

On motion of Mr. Alsdorf the Association then adjourned to meet in Detroit on the 2d Tuesday of October, 1885, at 10 o'clock a. m.



ANSWERS TO QUERIES

----AND-- -

VOLUNTEER PAPERS.

Why should druggists use the Pharmacopæia?

A. B. PRESCOTT, ANN ARBOR, MICH.

1. Because the Pharmacopæia is the proper and legally constituted authority for standards of identity, purity and strength of the principal medicines furnished by the druggist.

Not indeed all medicines which the druggist is to furnish are Pharmacopæial articles. It comes within the province of pharmacists to furnish to their patrons any articles which may be called for, in good faith, as remedies for the relief or prevention of disease—and many such articles are not included in the lists of the Pharmacopæia. Nevertheless, by far the greater portion of the medicinal material dispensed by the pharmacist, and a still larger proportion of the material given by order of physicians, is material legally defined in its identity, strength and purity, by the Pharmacopæia. Its authority is not individual, but representative of the organized physicians and pharmacists of the country—and so far a professionally legal authority.

If it be true that certain of its standards be not most wisely chosen, this is no reason for inattention to them. It must be re-

membered that uniformity is the most essential feature of any standard, and uniformity can be sustained only by consulting an authority accepted by all. In the single feature of the strength of galenical solutions, it is of the first importance that this strength shall be the same at the hands of each prescriptionist -- the same in Maine that it is in California. And in order to have an authority that shall be single and undisputed for the country, the authority must needs be representative. Many a man might be capable, in and of himself, of making as good a Pharmacopæia as that of the United States; and we might nearly say that one man could do it with a twenty-fifth of the labor devoted to it by the twenty-five of the Committee of Revision, but be it observed, as surely as we should have a standard furnished by one man, we should have various standards set up by various men and the prime object of a single authority for uniform standards would fail to be attained.

- 2. Again, in the mode of making the medicinal preparations most used, a national standard should be before the eyes of every dispensing pharmacist and every manufacturing pharmacist who undertakes to produce these preparations. It is not necessary now to answer the question, must the pharmacist invariably follow the last Pharmacopæia in making every tincture and every syrup called for by Pharmacopæial name. It is only here declared that if he does not follow the directions of the Pharmacopæia he should have sufficient ground for the departure, and should keep the text of the national authority before his eyes as a point of departure, if liberty of departure be taken.
- 3. Because, in this country, the Pharmacopæia is a joint authority, created and adopted by the physicians and pharmacists, it should be scrupulously regarded by the latter as a daily hand-book—the guide in judging the quality and fixing the strength of the many articles which the pharmacist furnishes upon the direction of the physician. In scarcely a country in the world are pharmacists so fully in possession of their just equal voice in the authority of the Pharmacopæia as in the United States. In the fitness of things, physicians and pharmacists are to unite in the compilation of the Pharmacopæia: the physician to decide what articles are worthy a place in this national code, and the pharmacists to elaborate the

descriptions, the tests of identity, purity and strength and the modes of preparation of these articles. Now, as a matter of fact, in the revision of a Pharmacoporia, it proves to be a light task to decide what articles shall be retained in its lists, and a heavy task to complete its descriptions, tests of identity and purity and strength and processes of preparation. And as a matter of fact the Pharmacopæias of the world owe little to the attention of medical men and much to the attention of pharmaceutical men. For the most part, in all the countries, the pharmacists make the Pharmacopæias. This is as true in Great Britain as it is in the United States. in Great Britain our pharmaceutical brethren have worked faithfully at the request of the Medical Council, a body in which they have had no representation, and they are now striving earnestly to obtain what the pharmacists of the United States have enjoyed since 1840, an equal voice in the governing body by whose direction the Pharmacopæia is issued. Now, in the Pharmacopæial Convention of May, 1880, at Washington, there were eleven pharmaceutical organizations represented, with 35 organizations of medical bodies, including the U.S. army, navy and marine hospital service. In the committee of twenty-five, for the revision and publication of the work, not less than fourteen are pharmaceutical representatives. And it is fair to say that by far the heavier and more responsible labor of the revision has been in that division devolving upon those counted within the fourteen pharmaceutical representatives. It is true, however, that all the radical changes in the Pharmacopæia, including the use of weights for liquids and other changes which have incurred severe criticism, were determined by the convention, in which medical delegates held a very large majority. On the score of a professional interest in a representative work, then, every pharmacist should assuredly take an active interest in his Pharmacopæia, an interest in its merits and in its defects, an interest in the improvement of the next revision, which will be upon us before we are aware of it. That the physician should be neglectful of the national Pharmacopæia—a neglect not to his advantage—is certainly no good reason for the much more unfortunate neglect of the pharmacist.

4. Pharmacists should use the Pharmacopæia as a separate book, because no other work gives us the entire Pharmacopæial

text unmixed with other matter. It is true that we have very useful and excellent works in the dispensatories, and there is an impression that the dispensatory contains all that is in the Pharmacopæia and a great deal else beside. It is just this impression, with the fact of the great value and convenience of the dispensatories, that accounts for the truth that American pharmacists have made less daily use of their Pharmacopæia than the pharmacists of any other country. Until lately there has been but one dispensatory, the "United States," and every druggist has had it, and it has held almost the place of an official authority-- while it was but the authority of two able men, Messrs. Wood and Bache. In this state of affairs it has been especially unfortunate that the text of our Pharmacopæia was quoted in the dispensatory, only for convenience of the work, along with quotations from the British Pharmacopæia; mostly without separation of paragraphs, without difference of type and often without quotation marks-so that the credit, though always given, was often overlooked by the reader. The druggist often remarks that he makes this or that "according to the dispensatory,"- with hardly discrimination whether he took the "U. S." or the "Br." process when both were quoted by the dispensatory. In the latter work the tests of the Pharmacopæia, as well as its descriptions, have been given only in part and intermixed with voluminous matter. In this way the national code has lost its distinctive character, as a representative authority, with a large portion of the pharmaceutical profession. At present the very fact that there are two competing dispensatories, also that new authors have re-issued the United States dispensatory, will do much to suggest to every pharmacist that he should have the Pharmacopæia by itself—aside from all commentaries, however excellent.

And your Committee willingly give their word that any pharmacist who once enters upon the habit of the daily use of the Pharmacopæia, as a work by itself, will never again consent to be destitute of the latest of the decennial revisions of our national code of pharmacy. The revision of 1880, whatever be its defects, cerainly surpasses all other Pharmacopæias in the fullness of its descriptions, and has received high encomiums at the hands of the pharmacists of England, Germany and France. It is for the cul-

tivation of exactness on the part of the pharmacist, and of improvement on the part of the Pharmacopæias of the future, that the recommendation is given to make it a daily hand-book in every drug store.

Sulphates of the Cinchona Alkaloids. How much Water of Crystallizing do they Contain as met with in the Market?

A. B. LYONS, M. D., DETROIT, MICH.

In the good old times, when quinine was worth a little less than its weight in gold, it was an interesting question to the purchaser how much of his money he paid for that cheapest of commodities (vilissima rerum) water. While from the commercial standpoint this question is rapidly losing interest, it must ever remain for the therapeutist and for the practical pharmacist one of considerable importance.

The text-books state that crystallized sulphate of quinine contains seven molecules of water of crystallization—at least they so write its formula, and the U. S. Pharmacopæia follows the lead of other authorities, with a practical qualification, however, in its requirements for this salt which admits the possibility of an additional molecule.

The well known fact in regard to quinine sulphate is that while it does assume in crystallizing seven molecules at least of water of crystallization, it retains this only when protected from evaporation. Exposed to a dry air at ordinary temperatures it even loses all but two or three molecules of this water. In a damp atmosphere it will absorb a certain proportion of moisture, as any other slightly hygroscopic substance will, but we may ordinarily expect to find after prolonged exposure only about one-half the quantity of water which was originally present in the crystals.

Actual analysis seems to show that the crystals contain a little more than seven molecules of water, but less than eight, and some authorities state the quantity as seven and one-half, which probably is near the truth.

In the case of an efflorescent salt, and one which crystallizes in such capillary needles, it is very difficult to decide just how much of the water found belongs to the compound.

The German Pharmacopæia and the French Codex allow 15 per cent. of water of crystallization, an amount corresponding pretty nearly with 7½ molecules. The U. S. P. allows 16.18 per cent. or 8 molecules. Of course it would be an injustice to manufacturers to rule out a quinine which does not contain a fraudulent excess of water, but on the other hand too great liberality in authoritative requirements puts a premium on fraud. The wise course is to draw the line in such a case as this pretty strictly in accordance with theoretical considerations, provided these are founded on a sufficiently broad basis of observation. I have had occasion very frequently to make examinations of commercial quinine sulphate and I have thought that a resume of my observations as to the amount of water actually contained in the salt as it is met with in commerce, might be of interest and possibly of value.

Out of 103 samples of quinine sulphate examined I found:

2	•	•	•	•		•	•	•	٠	•	•	•	•	•		 •	cent.	per	8	and	cen 7	betw	Containing
1																	"	"	9	"	8	"	"
3										٠							"	, "	10	"	9	"	"
2																	"	"	ıı	"	10	"	"
10																	"		12	"	11	"	"
8				 													"	66	13	44	12	"	"
16																	"	. "	14	"	13	"	"
41					٠.												٠.		15	"	14	"	"
14				 													"	.5 "	15	"	15	"	"
4				 														j "	16	,5 "	15.	"	"
1				 													"	46			16	"	"
1				 				٠.									"	"		·75	16.	"	4.

Packages found to contain less than 14.5 or 15 per cent. of water, had evidently lost weight; in the original condition the quantity of water must have been in nearly every case as high as 14.5 per cent. with an average near 15 per cent.

Probably we see here to a certain extent the influence of the authority of the German Pharmacoposia, for manufacturers must have an eye to the requirements of the standard authorities; still it is fair to conclude that practically 16 per cent, is too large an allowance to make for water in quinine. From the standpoint of the physician it would be much better to place the limit at 8 per cent, contemplating the use of an effloresced salt—since it is such a salt that is almost universally dispensed in practice.

In regard to the quantity of water of crystallization in quinidine sulphate, authorities agree, and the facts are nearly in accordance with the theories. I find, however, some mis-statements of the facts in the text-book most in use. The U. S. Pharmacoposia states that the salt contains 2 molecules of water of crystallization, but gives the percentage as 4.3. The correct figure should be 4.604 per cent. The U. S. Dispensatory naturally follows the Pharmacoposia. The National Dispensatory, second edition, gives a formula containing 2 molecules of water, but states the molecular weight of the compound as 836 instead of 782, the former number corresponding with 8 molecules of water, and further gives the percentage of water as 8.6.

This salt holds its water of crystallization with much greater tenacity than the sulphates of quinine and cinchonidine. A temperature 120° C. is required to render it anhydrous.

The amount of water in this salt is so small that there can be but little variation in its "strength," unless it should be found that it could be induced to assume a larger proportion of water.

I have examined only a few samples, and my records show that but two out of six samples contained as much as 4 per cent. of water, the others containing respectively 3.7 per cent., 3.5 per cent. and 2.25 per cent.. (?)

Cinchonidina sulphate crystallizes sometimes with a larger, sometimes with a smaller proportion of water of crystallization, and the text-books give conflicting statements, but do not cite original authorities. The National Dispensatory 2d Ed. assigns it 4 molecules of water of crystallization. Allen, "Commercial Organic Analysis," gives it 6. The U. S. Dispensatory, following the Pharmacopæia, (revision of 1880) states that from concentrated solution it crystallizes with "3 or 4" molecules, from dilute solutions with

"6 or 7," giving as the equivalent percentages respectively 7.03 and 13.13; the first statement ought to read without equivocation 3 molecules, the second 6 molecules. Only 8 per cent. of water is, however, allowed to the requirements subsequently given.

From an examination of quite a number of samples of the cinchonidine sulphate of commerce, I am led to the conclusion that here the requirements of the U. S. P. are too stringent.

Out of twenty-two samples of cinchonidine sulphate examined I found:

Containi	ng less th	an	8 pe	r ce	ent.											4.
"			8.6		"											ı.
"	between	10	and	11	per	cent	t									8.
"	"	11	"	I 2	"	"										3.
"	"	12	"	13	"	"										3.
"	"	13	"	14	"	"										2.
66	over	14			"	"										ı.

The lowest amount was 6.1 per cent., the highest 14.5 per cent. From this it would appear that a salt containing about 4 molecules of water is practically that most frequently met with, although it is possible that this is an effloresced salt. It certainly does not have this appearance, the crystals being bright and well defined. The salt certainly sometimes contains six molecules of water of crystallization, and the Pharmacopoia can therefore hardly refuse to recognize crystals which contain 13 per cent. and upwards of water as true sulphate of cinchonidine. The requirement as it stands would exclude four-fifths of the cinchonidine sulphate in the market. Perhaps it would be well to fix it so low as to induce manufacturers to give attention to producing a salt containing 4 molecules of water, and in this way lead to greater uniformity in this important article of the materia medica.

Do preparations of aloes with bicarbonate of potassium or sodium lose medical power in losing their bitterness?

GEORGE MCDONALD, KALAMAZOO, MICH.

It has long been known that solutions of aloes with bicarbonate of sodium or potassium, when kept, gradually lose their bitterness. With simple carbonates of the alkalies the loss of bitterness is much more rapid, and with free alkalies, more rapid still. The change is also much hastened by free exposure of the solution to the action of the air. As aloin the bitter principle and also the reputed active principle of aloes is decomposed by alkalies, there can be no doubt that the change in taste is due to the destruction of this principle, but whether with the loss of bitterness there is also a loss of medicinal efficacy, is a matter concerning which but little information appears to be obtainable in either pharmaceutical or medical literature. In fact the only information the writer has been able to find on the subject, is an article by Prof. Wm. A. Tilden, which appeared in the Am. Jour. Pharmacy in 1871, and which was written in reply to a query of the British Pharmaceutical Conference, as to what the loss of bitterness in Comp. Decoct. Aloes, was due. In this article Mr. Tilden says that Mr. Wm. Young, pharmaceutical chemist, had written him that he had frequently taken a fluid ounce of Comp. Decoct. Aloes of various degrees of bitterness, and had always found it produce the desired effect, while Mr. Tilden states, on the other hand, that he had himself taken large doses of the oxidized alkaline solution of aloin, or extract of aloes, without perceiving the slightest effect. timony is very conflicting, and therefore unsatisfactory.

The chief medicinal use of aloes being that of a purgative, the most important fact to be determined would be whether the loss of bitterness in alkaline solutions of the drug was accompanied with a corresponding loss of purgative action, and to this end the writer enlisted the services of a careful, painstaking physician to assist him.

A solution was prepared, consisting of aloes 10 drams, bicarb.

sodium 22 drams, and water 2 pints. This (with the exception of a small quantity of Comp. Spts. Lavender) represents the old and well known "Mettatter's Aperient Solution." As its name indicates, it was intended as an "aperient," and the directions of the originator were that it should stand for one year before using, and that it then should taste "slick," and be devoid of bitterness.

The above preparation, after thorough maccration, was filtered and divided into four equal parts, two of which were tightly corked, and the other two left open. At the expiration of about two months those which were corked were still decidedly bitter, and had the unmistakable aloes taste, while those which had been left open had lost every trace of bitterness, and had only a mawkish alkaline taste.

One of the bottles containing the bitter solution was given to the physician, with instructions to test as to its purgative effect. After he had used it he was given one of the bottles containing the solution which had lost its bitterness, with instructions to test its purgative effect on the same persons, if possible, on whom he had tried the bitter solution. He was then given the remaining bottle of the bitter solution, and after that the other bottle of the tasteless solution, with the request that he would carefully note and compare results. The general result obtained was, that while three-fourths of a teaspoonful of the bitter preparation would produce a healthy, natural movement in a person of costive habit, it would require not less than two teaspoonfuls - or about three times the quantity- of the preparation which had lost its bitterness, to produce a similar effect on the same person. In other words, he was satisfied from his observations that the solution which had lost its bitterness, had only about one-third the purgative power of the one which still retained its bitterness, and had not been exposed to the action of the air. From experiments the writer has himself made, he is also satisfied that the solution of aloes with bicarb. sodium does lose in purgative activity as it loses in bitterness. How much the loss in bitterness may affect the tonic, stomachic and other medicinal effects aloes is reputed to possess, the writer does not undertake to say, and in fact, the time, experimental research and ability necessary for the determination of such a problem, are such as to deter him from making the attempt.

If the above deductions as to the loss of purgative power are correct, and the writer believes that they are, it would necessarily follow that all liquid preparations of aloes with the alkaline bicarbonates, if used with a view to their purgative effect, should be used in as fresh a condition as possible. They should also be kept tightly corked, as the oxidizing action to which the loss of bitterness is due, is greatly accelerated by free contact with air. These remarks will apply with even greater force to solutions containing alkaline mono-carbonates, or free alkali, as the stronger the alkilinity the more rapid is the change.

It is worthy of note that while the loss of bitterness is acompanied with a very decided diminution of purgative activity, the purgative action does not seem to be entirely lost. A quantity of the solution (two fluid drachms) representing about five grains of aloes, would still seem to have, at least, a slightly laxative action. May it not be either that the product of the oxidation of aloin in the presence of alkalies and their carbonates still possess some laxative action, or that the purgative action of aloes may not be due to alion alone?

What solid extracts are most favorable to preparation by the dispensing pharmacist?

OTTMAR EBERBACH, OF ANN ARBOR.

In attempting a reply, I would state that the same will be based on general professional principles and my experience in the preparation of various pharmaceutical preparations.

For some time past it has been a belief of mine that pharmacists should make or have their assistants prepare many of the articles they have supplied by the manufacturing chemists.

Such preparations being made on a small scale, utilizing the many spare moments otherwise wasted, it will not be necessary to take a strictly mercantile view of the matter and figure the time spent as part of the cost of production. It is not expected that we compete with large manufacturers, neither is it necessary that we attempt the preparation of articles requiring skilled labor and expensive apparatus, as there are many articles that can be made advantageously at home, with ordinary appliances found in any good pharmacy.

In my experience there is a saving of 25 to 50 per cent. which from a mercantile point of view needs no further comment.

But there is more potent reason for home manufacture. It is the acquirement of a professional training and skill of our assistants and apprentices, they deriving a benefit from practical pharmaceutical work which cannot be overestimated, helping them to knowledge for future achievements, and the principal to skilled labor and its advantages.

By the present mode of conducting pharmacies or rather drugshops, the pharmacist is placed on the same footing as a tradesman, a buyer and seller of drugs, chemicals and patent medicines, entirely ignoring the fact that as a competent pharmacist, he is by virtue of his training and knowledge a professional. To these conditions we will have to attribute to great extent our difficulties caused by the tendency to depreciate prices due to the fact that pharmacists themselves look upon their vocation as that of a tradesman rather that of a profession. It should be our aim to elevate pharmacy to such a standard that it will be esteemed and respected as a profession and not a trade, and we should endeavor to walk in the higher spheres of our profession, where our knowledge and achievements can be brought to use, and not be content to make only tinctures, syrups and ointments, or take on trust as to quality anything that the wholesale trade may see fit to send us.

Based on experience and in the spirit of the above remarks, I answer the query in the affirmative, stating that with but few exceptions all of the officinal extracts can be made by the dispensing pharmacist. For reasons of economy, especially if quality is to be considered. The pharmacist being careful not to use any other but fresh select material he will find ample compensation, as he

penetrates the mysteries of pharmaceutical processes in the results of manipulations, in the gratifying comments from careful and observing physicians, at the same time making himself better qualified to judge similar articles procured from manufacturing chemists without which we would be at a loss, there being numberless articles which the pharmacist must procure from them, preparations requiring complicated apparatus, much time and capital, and last but not least for reasons of the educational achievements, by which all would contribute very materially to secure for pharmacy the well deserved confidence and respect due an independent profession in our state.

To what extent do the pharmacists of this State register the sale of poisons, and how far are they liable for failure to do so? What articles should be regarded as poisons for registration of sale?

H. J. BROWN, ANN ARBOR.

Three questions are comprised in the query which I shall undertake to answer. First—To what extent do the pharmacists of the state register the sale of poisons? Second—How far are they liable for failure to do so? and Third—What articles should be regarded as poisons for registration of sale?

In reply to the first question I may say that while my investigation of the subject has not been as thorough as I had hoped to make it, the information which I have been able to obtain indicates that only about one in seven of the pharmacists of the state keep a poison record at all, and the majority of those who do keep one, I am led to believe, do not fully comply with all the requirements of the law which provides that all poisons sold shall be registered. I fancy very few of us who keep a record make an entry of every

bottle of morphine sold to habitual users of the drug, or to physicians, yet the law has no exceptions to cover such cases. I conclude therefore that the law requiring the registration of poisons is quite generally disregarded, in fact I have no doubt that there are very many druggists in the State, and possibly some within the reach of my voice, who are ignorant of the fact that there exists such a law, and this is, I think, one of the main reasons for such a wide-spread disregard of the law as I believe exists. There are other reasons which occur to me but I will refer to them later.

Coming now to the second part of the query. As to how far druggists are liable for failing to obey this law. I suppose a simple statement of the penalty provided by the law as a punishment for violating any of its provisions will suffice. It reads: "And each and every neglect to keep such a record as herein provided, will be deemed a misdemeanor and the person or persons guilty thereof shall, upon conviction thereof, be liable to a fine not exceeding fifty dollars." This is the penalty provided for failure to make a record of the sales of all poisons. There is also a law, sec. 5 of chapt. 323, which provides, "that any person who shall sell or deliver at retail, any arsenic, corrosive sublimate or any other substance or liquid usually denominated poisonous, without having the word poison and the true name thereof, and the name of some simple antidote, if any is known, written or printed upon a label attached to the vial, box or parcel containing the same, shall be punished by a fine not exceeding one hundred dollars." Thus the law imposes a heavier penalty for neglect to properly label poisons than for failure to keep a record of the sale of the same. And this is, I think wise and just, for while it is often difficult and annoying, to the customer as well as to the busy pharmacist to take the time and trouble to make a record of every little sale of poison, there can be no good reason why he should fail to attach a proper poison label. I know that we are often rebuked by our impatient and thoughtless customers who do not wish to be detained, and who say to us "O I know that is poison," and "I guess I know how to use that" etc., but such annoyances should not deter us from our duty, for it is a duty which we owe to ourselves not less than to the public. Touching the reasons why the pharmacists of the State have failed to better obey the law in regard to keeping a

poison record, I think they are chiefly these: first, as I have already said, because the law requiring that such a record be kept is not generally known, and second, because the requirements of the law are too great. A strict interpretation of the law would, I suppose, require the registration of all prescriptions containing poisonous articles, a requirement which I am sure physicians as well as druggists would consider entirely unnecessary if not indeed harmful. A third reason may, I think, be found in the fact that pharmacists are, as a rule, exceedingly busy and hard working men and many times in the press of business it is well nigh impossible for them to take the time necessary for making a careful record of every sale of poisons, the great amount of labor and trouble which is involved in complying with all the requirements of the law is made apparent.

In answer to the third and last part of my query it seems to me it would be much wiser to require that a record of only the most active poisons and such as are most frequently called for for questionable uses, should be kept. I would suggest as such the following: Arsenic and its preparations, Corrosive sublimate, Potassium Cyanide, Oils of Tansy and of Bitter Almonds, Hydrocyanic acid, Nux Vomica, and its preparations, especially Strychnia, Opium and its preparations, except Paregoric. In regard to gum opium and morphia sulphate, I think that in the cases of sales to known habitual users of the drugs, it should be optional with the pharmacist whether he make a record or not, as in such cases the drugs named cease to be poisonous to a great extent. I am aware that I have omitted from the list many articles "usually denominated poisonous," and notably Paris Green. This I did because I know if it were included in such a list that nearly every pharmacist in the state would violate the law over and over again before another summer shall have passed. And I am one of those who do not believe in making laws which no one will obey. It engenders a spirit of defiance, contempt and consequent disregard of all laws. The list I have given, you will recognize as being the same which your committee on legislation recommend as poisons of which a record should be kept. I have found in examining the laws of several states bearing on the subject that two schedules are usually given, one only of which requires to be registered.

I have thus tried to answer briefly the questions of the query and while I am aware that I have not treated the subject in an exhaustive manner, I trust I have presented a few thoughts, familiar though they may be to most of you, bearing upon this vexed but vast and important subject of poisons, which may at least provoke some discussion and thus lead to a better understanding of the subject, among the members of our profession and by the public as well. Before closing I wish to make acknowledgement for kind assistance rendered me in obtaining information on the subject to our ever obliging and efficient Secretary and also to Mr. F. N. Mosher of Messrs. Farrand, Williams & Co., and Mr. C. S. Burroughs of Jno. J. Dodds & Co.

Does the phosphoric acid of the market bear the Pharmacopwial tests for strength and purity?

HUGO THUM, GRAND RAPIDS, MICH.

In submitting my report in answer to the query, "Does the phosphoric acid of the market bear the Pharmacopæial tests for strength and purity," I must state that my time during the year was too limited to make a sufficient number of examinations and that therefore the question as to the general quality of the phosphoric acid of the market has not been answered. I respectfully submit the little work I have been able to accomplish, hoping that it may lead to a further investigation of the subject. Three samples of dilute phosphoric acid were examined. The manufacturers were Chas. Pfizer & Co., W. II. Schieffelin & Co., and Hazeltine, Perkins & Co. They are here designated, without respect to consecutive order, as No. 1, No. 2, and No. 3. The results of the work are given in the following table in which the first

column contains for the purpose of comparison the reactions of Pharmacopæial dilute phosphoric acid:

	Pharmacopæial Dilute Phosphoric Acid	Sample 1.	Sample 2.	S.mple 3.
Specific Gravity	1.057	1.0734	1.0568	1 0721
Nitrate of Silver	No precipitate	No precipitate.	No precipitate	No precipitate.
Mercuric Chieride				
Ferrous Sulph with				
Sulph. Acid	No brown color.	" brown color.	" brown color.	No ' rown color
		A precip of		
Baric Chloride	No precipitate	baric sulph	No precipitate.	No precipitate.
Tincture of Iron				
Hydric Sulphide		••		
Wt. of Lead Oxide and		i		
Phosphate	5 36	5.4/H	5,362	5.457
Percentage of H3, P O4.	10.	13.	10.	12 5.

From the above it will be seen that the acids examined answered the required tests for purity, except the small amount of sulphuric acid present in sample 1. In strength, samples 1 and 3 are somewhat higher than the Pharmacopæial.

Report on the collection of crude drug's from both wild and cultivated plants in Michigan.

F. W. R. PERRY, DETROIT, MICH.

The following report on the collection of wild and cultivated plants in Michigan has been procured by getting reports from different sections of the state.

I found that as a rule that which comes into the hands of the retailer is retained and used by himself. The bulk of the collection is made by persons who make it their business. I have obtained my information from the druggists throughout the state, and from the different manufacturing and jobbing houses in Detroit. In the following list, those marked with a circle (0) are in good demand,

and those with an asterisk (*) are collected in considerable quantities in some localities.

SUMMARY.

Number of different plants,	· -	200.
-	genous,	67.
Plants indigenous not collected b	out officinal	28.
American Columbo,	root,	Ind.
American Saffron (Carthamus	,)flowers.	
o Adder's tongue,	leaves.	
o* Angelica root.		
* Agrimony,	herb.	
Alum root,	root.	Ind.
* American Larch.		
Angelica,	leaves.	
* Arbor Vitae.	"	
* Avens, (water,)	root,	Ind.
*o Bitter root, (Dogsbone.)		
o* Bitter Sweet, (false,)	bark.	
o Bitter Sweet (true)	twigs,	Ind.
*o Black berry,	bark of root,	Ind.
*o Black Indian hemp,		Ind.
Black haw,	bark.	
o Blood root,	root,	Ind.
o Blue cohosh,	root,	
*o Blue flag,	root, •	Ind.
*o Boneset,	leaves,	Ind.
*o Burdock,	root,	Ind.
*o Butternut,	bark of root,	Ind.
Balm of Gilead,	buds.	
* Balsam fir,	bark.	
* Beech,	bark.	
* Beech,	leaves.	
Beech drops.		
* Birch,	bark.	
* Bitter bugle.		
Bitter sweet, (true)	leaves.	
* Black alder,	bark.	

* Black berry,	root,	Ind.
* Black ash,	bark.	
Blazing star,	root.	
* Blue vervain,	herb and root.	
* Buck bean,	leaves and root.	
* Buck horn,	brake.	
* Bugle weed,	herb.	
* Burdock,	leaves and root.	
* Butternut,	leaves,	Ind.
* Button bush,	bark.	
o* Catnip,	· leaves,	Ind.
o* Chestnut,	leaves,	Ind.
o* Clover tops, (red)	tops.	
o Crawley root,	root.	
o Culvers root,	root,	Ind.
* Calamus,	root,	Ind.
Canada thistle,	root.	
* Cardinal leaves, (blue.)		
Carpenter's square,	herb.	
Celandine impations pallida	•	
Cohosh (black)	root,	Ind.
* Chick weed,	herb.	
Cicely sweet,	root.	
* Cicuta,	leaves.	
* Cinquefoil,	herb.	
Cleavers,	herb.	
Clover sweet.		
* Clover tops, (white.)	•	
* Cockle bur.		
Corn sweet.		
Cohosh, (re.1)	root.	
Cohosh, (white)	root.	
Columbin 2.		
Consumption brake.		
* Coolwort,	leaves.	
Corn silk, (cultivate l.)		
Couch gras, (not common	.)	
Cramp bark.		

* Cranes bill,	root,	Ind.
o* Dandelion,	root,	Ind.
* Dandelion,	herb.	
o Elecampane,	root,	Ind.
* > Elder flowers,		Ind.
o Elm, slippery,	bark,	Ind.
* Elder bark,		Ind.
* Evening primrose,	leaves.	
Dogwood flowering,	bark flowers,	Ind.
* Dwarf elder, flowering.		
* Fern sweet.		
Fever bush, (berries)	bark.	
* Fire weed,	leaves.	
Fir plant, (not common:)		
'* Five finger,	root.	
Five flowered gentian.	·	
* Fleabane,	leaves,	Ind.
* Frost wort,	herb,	Ind.
o i Golden thread,		Ind.
o Gold seal,		Ind.
o * Gravel plant.		
Green dragon.		
* Green osier,	bark.	
Hops,		Ind.
o* Hair cap moss.		
Hard hack,	leaves,	Ind.
* Hemlock,	bark,	Ind.
* Horse mint,	leaves,	Ind.
Horse chestnut, (cultivate	•	
Horse chestnuts, (cultivat	ed)	
Horehound,	herb,	Ind.
* Hound's tongue,	leaves.	
o* Indian turnip,	root.	
* Ironwood,	core.	
o Juniper berries,		Ind.
o* Jersey tea,	root.	
Jerusalem oak,	leaves.	
* John's wort,	herb.	

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«* Sarsaparilla American,	root.	
o* Sassafras,	bark,	Ind.
o Scullcap,	leaves,	Ind.
o Senega,	leaves,	Ind.
o Skunk Cabbage,	root,	Ind.
o* Snake Canada,	root,	Ind.
o* Solomons Seal,	root.	
o Spearmint,	leaves,	Ind.
o* Spikenard,	root.	
o* Squaw Vine.		
o Stone Root.		
o Stramonium,	leaves and seed,	Ind.
* Scouring Rush.		
Sheep Laurel.		
Sheep Sorrel, [rumex acetos	ella,] leaves.	
* Shell Bark Hickory.	_	
* Shepherds Purse.		
Snake root button.		
o Strawberry,	leaves.	
* Sumach,	bark, leaves and berries.	Ind.
Sundew.		
Sunflower [cultivated]	seeds,	
Sweet gale.		
o Tansy,	leaves,	Ind.
o Turkey corn [scarce]	root.	
Thimble weed,	herb.	
Tomato [cultivated]	fruit.	
Twin leaf [scarce]	root.	
o Unicorn [aletris farinosa,]	root.	
Unicorn, false helonias dioid	ca.	
o Uva ursi,	leaves.	Ind.
* Vervain, blue,	root.	
* " white,	root.	
* Virginia stone crop.		
o Wafer ash [not common]	bark.	
o Wahoo,	bark of root,	Ind.
o* Wahoo,	hark of tree, bark.	Ind. Ind.
o wille our	1/44 264	THAI.

o* Wild indigo,	root.	
o Wild yam,	root.	
o* Wintergreen,	leaves.	Ind.
o* Witch hazel,	bark and leaves.	
o* Yellow dock,	root.	Ind.
o Yellow parilla,	root.	
* Walnut, black,	bark and leaves	
* White ash,	bark.	
* White Indian hemp.		
* White pine,	bark.	
* White pond lily,	root.	
* White poplar,	bark.	
White willow,	bark.	Ind.
* Wick-up,	herb.	
Wild cherry Ino demand	for northern] bark.	
* Yarrow,	leaves,	Ind.
* Yellow pond lily,	root.	
Yellow poplar,	bark.	

Is the new Pharmacopoeial process for the preparation of essential waters a satisfactory one?

L. T. WHITE, EATON RAPIDS.

I am obliged to render my answer in the negative for the following reasons, to-wit:

1st. The new process recommends only one half as much of the essential oils, consequently it is too weak for their main purpose, that of disguising unpleasant medicines.

2nd. You suffer an unnecessary loss of the valuable agent by getting the larger share of it under your finger nails and on the ends of your fingers in the process of picking the cotton, may possibly suffer harm from the oils getting under the nails of the fingers.

3rd. By several percolations you may secure a clear water, but eventually it turns milky to a greater or less extent.

Is "Black Antimony" still in use in dispensing pharmacy? If so, what is its character?

GEORGE GUNDRUM, IONIA.

To the first question "Is Black Antimony still in use in dispensing pharmacy" I must answer in the negative. The use that the so called Black Antimony is put to, so far as I know, is in the so-called Condition Powders, but what sort of condition it is good for, is more than I can tell. It being used very often by ignorant persons, with whom the price of a Condition Powder is more than the quality of the ingredients, has led no doubt step by step to the lowering of the price and quality and finally to a substitution altogether.

By the nature of the inquiry that "if so," meaning if found in dispensing pharmacy, which is answered in the negative, there was nothing further to do, but I thought it might be of interest to the members of this Association to know how much Antimony there was in Black Antimony (Crude Sulphuret) and I will report what I found on looking into the matter a little closer.

I obtained ten samples. Eight were obtained in our own state and two in the city of Milwaukee. Those from our own state were taken from different places reaching from and including Detroit and Petoskey. I was surprised to examine five samples and not find a trace of Antimony, but in the sixth, I was agreeably surprised to find on addition of H2S a precipitate. The four remaining were no better then the first five. In the two samples from Milwaukee I called for the best if they had more than one kind. In the only sample that had any Antimony, it was only a trace.

What are the highest percentage practicable for sulphurous acid in watery solution, what are the corresponding specific gravities, and how can the solution be best preserved?

CARL RIEBE, CHICAGO, FORMERLY OF ANN ARBOR.

The U. S. P. '80 requires a strength for sulphurous acid of about 4 per cent. sp. gr. 1.022 to 1.023 at 15° C. In comparing with the requirements of the U. S. P. '70 we find that the percentage of gas has been reduced about one-half. Different authorities, in commenting upon this fact, are unable to understand the necessity for such a change; vide Dr. Squibb's "Ephemeris" of November '83, and the U. S. Dispensatory of '83.

It seems that the opinion had prevailed with the revising committee, that an acid strength of over 4 per cent. could not be kept for any reasonable length of time, by following the directions laid down by the Pharmacopæia for preservation.

This opinion contradicts all previous records of literature upon this subject. Wittstein, who introduced the use of charcoal and sulphuric acid, claims that water can be charged to 10 per cent. Hager in his "Pharmazeutische Praxis" gives the directions to saturate the water to 10 per cent. The British Pharmacopæia requires a sp. gr. of 1.040 at 15° C, or 7.5 per cent.; the process of the U. S. P. '70 has been mentioned.

It was, therefore, of some interest to investigate the limits of possible saturation, and the limits of practical strength for pharmaceutical and technical use. In connection with these experiments, some gravimetric determinations of the amount of sulphuric acid that will invariably be found even in a fresh solution, and the increase after some time were made, also a specific gravity table at the new standard, 15° C.

At the end of October, '83, in preparing a saturated solution of sodium sulphite, some aqueous sulphurous acid was made at the same time by inserting a bottle with water between the wash bottle and the two quart bottles, containing each a saturated solution

of sodium carbonate. There, of course, the saturation of the water was performed at a higher pressure than is the case in the usual modus of making sulphurous acid, for each quart bottle represents a column of about 4½ inches.

After saturation, the water was found to have a sp. gr. of 1.052 at 15° C., and on titrating with n-10 iodine solution, showed 10 per cent. of gas. But the loss of gas was so rapid that bottling seemed unsafe. So the solution was allowed to lose as much as it would at 17° C., then bottled, sealed and put in a cool, dark place. Three weeks later it was re-examined, then having sp. gr. 1.037 at 15° C., and was found to contain 7 per cent. of gas. The amount of sulphuric acid was estimated gravimetrically as 0.06 per cent. These results prompted me to make further investigations.

- 1. (March 22, '84.) A sample was prepared following the general directions of the process of the U. S. P. '80, but for generation of the gas a quantity of charcoal and sulphuric acid was taken, sufficient to overcharge the water in the receiver. After saturation, the temperature of the receiving bottle was raised to 20° C. Examination at 15° C. showed a sp. gr. of 1.049, and on titration 9.2 per cent. of gas. The loss of the latter during titration was very rapid, as will be noticed from the following results:
 - 1. Titration required 15.2 cc. of n-10 iodine sol.

during one hour of work.

At 8 per cent. and sp. gr. 1.0425, the solution became stable and could be bottled without danger of explosion.

- 2. (March 25.) Examination of the old sample made Oct., '83, as mentioned above: Spec. gr. at 15° C., 1.034, by titration, 6.5 per cent.
- 3. (March 28.) A second sample was prepared like No. 1. Receiver and conducting tubes were entirely filled with distilled water previously boiled, connection with the wash bottle was made after all the air had been driven out of the latter. On examination, sulphuric acid was found to be present as in all former samples, in spite of all exclusion of air.
 - 4. (April 8.) Sample prepared after the U.S. P. process of

'80: spec. gr. 1.023; 4 per cent. of gas.

- 5. (April 12.) Sample prepared after the U. S. P. '70. Spec. gr. 1.043, 8 per cent. of gas; 0.05 per cent. of sulphuric acid.
- 6. (April 15.) Hager's process given in his "Pharmazeutische Praxis," and that of the Br. Ph., gave about the same results as No. 5. In all these experiments, the liquid, after saturating it at a temperature of 3-5° C., was allowed to rise to 20° C., then examined at 15° C. Spec. gr. was always taken by weighing at 15° C., in a bottle with solid glass stopper. The per cent. of strength was determined by titration with a n-10 iodine solution.
- 7. (April 17.) Examination of a bottle of the old sample made Oct., '83, and which had been standing since Jan., '84 in a warm room and in the light. Spec. gr. 1.034; 6.5 per cent. of gas; 0.24 per cent. of sulphuric acid.
- 8. (April 24 and 25.) A specific gravity table was prepared. The weighings were done as before strictly at 15° C., the titrations immediately after each weighing in a cool room where the temperature did not exceed 16° C.

Per cent,	Spec. gr. 15° C.	at	Per cent S O2	Spec. gr 15° C.	at	Per cent. S O2.	Spec gr. at
9	1,048		6.0	1 032		3	1 017
8.5	1 045	,	5,5	1 03-1		2.5	1.014
8	1,043		5 0	1,028		2	1.011
7.5	1.040	1	4.5	1 026		1,5	1,009
7	1.037		4.0	1.023		1	1,006
6,5	1 034	- 1	3,5	1,020		0.5	1.003
-,-	1	1	-•	1		-,-	1

9. (May 2.) Some barium sulphite was added to one of the samples previously prepared. After examining on May 5, the sulphuric acid contained therein, had disappeared, the reaction showing the presence of some baryta. Samples prepared by adding some barium sulphite to the wash-bottle did not show any marked decrease in the amount of sulphuric acid.

Summing up the results of these experiments, I come to the following conclusions:

- 1. Water will not, at a medium temperature of about 17.5° C., retain more than 9 per cent. of gas.
- 2. It can be brought to a strength of 8 per cent. by following the process of the U. S. P. '70, but will after a short time come down to 7 per cent.
 - 3. The strength best suited for pharmaceutical and technical

purposes is 6.5 per cent., or sp. gr. 1.034, since it will keep for a long time by following the directions laid down in the U. S. P. 70 for preservation, and can be shipped without any risk of loss.

4. Sulphuric acid will always be present, though in so small an amount that it will not interfere with the medicinal value of the preparation. By adding some barium sulphite, and macerating for a day or two, the sulphuric acid of an old sample can be removed.

Does the Bromide of Potassium in use answer the tests of the Pharmacopæia?

A. L. GREEN, ANN ARBOR.

Five samples of K. Br. were obtained and examined. These samples were manufactured by different firms representing the leading manufacturers in the United States. The Pharmacopæia requires that the crystals laid upon moistened red litmus paper should not at once produce a violet-blue stain, (absence more than 1.0 per cent of alkali.) All five samples were found to produce a violet blue stain at once except No. 5 which did not at once produce the stain.

Nos. 1, 2 and 5 contained traces of an iodide, which is not allowed under the requirements of the Pharmacopæia.

"If dilute sulphuric acid be dropped upon crushed crystals of the salt, they should not at once assume any yellow color (absence of Bromate.)" This test showed that none of the samples contained the least traces of the Bromate.

With a test-solution of Barium Nitrate no immediate cloudiness or precipitate should make its appearance (limit of sulphate.) In Nos. 2 and 3 a precipitate was formed, in No. 6 a slight cloudiness.

"If three grams of the well-dried salt be dissolved in distilled water to make 100 c. c. and 10 c. c. of this solution be treated with a few drops of test-solution of bichromate of potassium, and then a

volumetric solution of nitrate of silver be added not more than 25.7 c. c. of the latter should be consumed before the red color ceases to disappear on stirring (absence of more than 3 per cent of chloride.) Every sample examined required a trifle more than 25.7 c. c. of volumetric test solution of nitrate of silver, running from 4 c. c. to 8 c. c. more than was allowed.

In conclusion it can be said of the five samples examined, all except one contained too much alkalin carbonate. In three were traces of an iodide; no one contained any bromate; in three there was more sulphate than was allowed; all went a little beyond the limit of chloride.

My query is, does the K. Br. in use answer the tests of the Pharmacopæia? in reply I would answer, no.

The mustard paper of the Pharmacopaia, is the process a good one, and is it advisory for the dispensing pharmacist to prepare it?

GEORGE MCDONALD, KALAMAZOO.

The writer in experimenting with a view to answering the above query followed strictly the directions of the Pharmacopæia, which are that the powdered mustard shall first be deprived of its fixed oil by exhausting with petroleum benzin, and afterward dried by the exposure to the air. The dried powder is then to be mixed with solution of gutta percha to a semi-liquid or suitable consistency for spreading. This mixture is then to be applied by means of a suitable brush to one side of a piece of rather stiff, well-sized paper, and the surface allowed to dry.

The experience of the writer is that the mixture cannot be applied with a brush, as it peels up off the paper and follows the brush, rendering it, in the writer's hands at least, impossible to obtain a smooth, continuous covering in this manner. He found,

however, that by spreading the mixture with a common 8-inch spatula a tolerable degree of success was attained.

It is fair to presume that the mustard paper of the Pharmacopæia was intended, if not to imitate that furnished by foreign and domestic manufacturers at least to furnish to the pharmacist a method by which he could manufacture one of equal quality in The mustard paper of the Pharmacoporia his own laboratory. differs, however, in many respects from that supplied by the man-The first difference which would suggest itself is that, as in the large manufactories the paper is probably spread by special machinery, and by persons who are experts in the business, the paper is more uniformly spread, and therefore more sightly in appearance than it would be possible for the majority of pharmacists to make it by hand. But there are other points of difference of much more importance from a purely practical standpoint. The mustard paper of the Pharmacopæia is spread on stiff, sized paper; that of the manufacturers on soft, unsized paper. mustard paper of the Pharmacopæia is therefore somewhat stiff and hard, that of the manufacturers soft and pliable, and more absorbent than that of the Pharmacopæia. On dipping in water the reaction resulting in the formation of "essential oil of mustard" is more rapid in the paper furnished by the manufacturers than in that made by the process of the Pharmacopæia. This is owing in part to the character of the paper used; but it is probable that it is in a greater measure due, either to the use of a liquid for mixing with the powdered mustard to bring it to a suitable consistency for spreading, which is composed of a solvent less volatile than chloroform, and containing a smaller percentage of resinous matter than the solution of gutta percha of the Pharmacopoia, or to the use of a smaller proportionate quantity of such liquid than would be necessary to use in cases where the paper was spread by hand.

In this connection the writer would say that in the course of his experiments he tried other solutions than that recommended by the Pharmacopæia for mixing with the powered mustard, and obtained better results from a solution of one dram of gutta percha in ten fluid drams of coal tar benzole, than from any other.

His reply to the query would be, that the process of the Pharmacopæia is not a good one; and in view of the cheapness and

superiority of the mustard paper offered by both domestic and foreign manufacturers, it is not advisory for the pharmacist to prepare it.

[Samples of mustard paper prepared by the process of the Pharmacopæia, also samples prepared with benzole solution of gutta percha, and samples obtained in the open market of both foreign and domestic manufacture, were submitted for comparison.]

What materials and manipulations are best for the turpentine emulsions?

GEO. GUNDRUM, IONIA, MICH.

The writer of this paper did not expect to offer or discover anything new, but merely state what in his judgment are the best materials and best and quickest modes of procedure to make a reasonably durable emulsion. Three substances suggested themselves to me, two of which are the most commonly used, viz., gum arabic and yolk of egg; and the third more common still, for who, even outside of our own profession, if he were asked what would combine oil and water, would not at once answer "soap"?

Seeing it stated in Eulenburg's Real Encyclopadie der Gesammten Heilkunde, vol. 4, page 541, that soap in powder in so small a quantity as one part of powdered soap would emulsify fifty parts of oil of turpentine, I thought to make trial of it. White Castile soap, in so small a quantity as one grain in one dram of oil of turpentine could not be objectionable therapeutically. One hundred grains oil of turpentine were put into a two-ounce vial, to which were added two grains powdered Castile soap, and agitated until dissolved, to which was then added distilled water to fill the vial; the same amount of oil and water was used with three grains of soap, and another with four grains, except that in this case the soap and water were mixed first and the oil added afterward.

They did not form lasting emulsions, but showed signs of separation in a very short time, less than one hour.

I did not make a trial of tragacanth emulsion, for gum tragacanth is said by Hager to make emulsions of short duration.

Gum arabic I tried, and found best adapted to form a quick and permanent emulsion. The method I think preferable is to put the powdered gum and sugar in the mortar; add the water, and proceed to make a mucilage. For a two-ounce emulsion take

Powdered	gum arabic	2 dr	ams
66	Sugar	2	"
Cinnamon	water	4	"

Grind in a mortar until uniformly mixed, to which add oil turpentine two drams in four equal portions, and completely emulsify each portion before the next is added. After the oil is emulsified add cinnamon water, slowly at first, say one dram first, the next time two, etc., until water enough is added to make a little less than two ounces; pour into vial; after which take as much as may be needed, and rinse pestle and mortar so as to bring up the amount to two ounces. This emulsion is as good after a week as the first day.

An emulsion containing twice the amount of oil turpentine can be made from the foregoing formula (1/4) and manipulation by using less water, and is just as permanent, but a little thicker, but will pour readily. The reverse, adding the oil to the gum and sugar, will make a fairly good emulsion, and can be done even more quickly, but, I think, is not so completely emulsified.

I also tried the following formula, contained in the New York and Brooklyn Formulary, but did not succeed in making a permanent emulsion:

Oil turpentine 2 fluid drams
Acacia, in fine powder 30 grains
Syrup ½ fluid ounce.

Cinnamon water enough to make two fluid ounces.

Pour the oil of turpentine into a two-ounce bottle, and having corked it, agitate it so that the inside of the bottle may be completely watted by the oil; then add the acacia, and shake again; finally add the syrup, and enough cinnamon water to make two fluid ounces, and mix thoroughly by shaking.

Yolk of egg was tried with good results, as follows: One yolk, with an equal weight oil of turpentine, about six fluid drams, with six drams powdered sugar, were made into a six-ounce emulsion by the addition of water, which showed signs of separation in less than an hour. One yolk, with four fluid drams oil, and four drams sugar and water, enough to make a four-ounce emulsion, were next tried, but it also showed signs of separation in about an hour.

One yolk with two fluid drams oil and two drams sugar, filled up with water to make a two-ounce emulsion, made a fine and permanent emulsion.

One yolk with three fluid drams of oil, and three drams of sugar, with enough water to make a two-ounce emulsion, made a good and permanent emulsion.

How can fluid extract of licorice be used the best to cover the taste of quinine?

NICHOLAS VANDENBELT, DETROIT.

This subject has been the source of considerable speculation, and as a result many formulae have been constructed that claim to answer the required purpose.

The fluid extracts made according to U. S. Pharmacopæia of 1870 and 1880 do not answer the purpose.

Different menstruums were experimented with upon the best samples of the root of glycyrhiza glabra that could be obtained in the market; but none of the preparations made covered the taste of quinine to any great extent.

The writer considered it needless to give an account of all the experiments made, for none of the preparations made directly from the root seemed to answer the purpose.

Finally several experiments were made with some samples of

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							Squi	bb's proces	.5	U, S. P.
No	. 4	Gum	opium	con	tained	morphia	8.5	per cent	:.	
		"	"		iı	"	11.4	"	II.	per cent.
			"		"	46	13.5	"	11.6	"
"	7	"	"		"	"'			8.5	"
ш	8	powd	. gum o	piun	n "	46	13.4	"	•	
£Ě.	9	"	66	"	"	66	12.69	"		
"	10	"	"	"	"	66	14.	"		
"	11	"	"	46	"	"	12.7	"		
"	12	"	"	"	"	"	10.8	"		
44	13	46	46	"	"	"	14.8	"	11.66	<i>"</i>
ш	14	"	"	"	"	"	13.5		10.9	"
u	15	"	46	"		"	15.78	"	12.24	. "
"	16	"	"	"	٤.	"	15.08	- "	10.	"
						i	(16.52	; " " ; "		
44	17	"	"	"	٤.	"	16.9	"	14.18	"
	٠,		•			. 1	16.46	, "	13.7	"
							(10.8	"		

The last (No. 17) was a sample of Squibb's powdered opium and was marked 15.5 per cent. morphia. Four estimates were made of this sample according to Dr. Squibb's method with a variation of only .44 per cent. yet all were about 1. per cent. higher than the label indicated. Two more estimations were made according to U. S. P. process, with a variation of .48 per cent. which was from 1.3 per cent. to 1.8 per cent. lower than the label indicated. The writer is of the opinion that by the U. S. P. method all the morphia represented in the opium is not obtained. While the figures representing the estimations by Squibb's method are perhaps too high, yet just at present I am not prepared to suggest any improvement.

Perfumes and formulæ for their manufacture.

JACOB JESSON, MUSKEGON, MICH.

The query "How far is it expedient for pharmacists to manufacture their own perfumes, and what formulæ be proposed for their manufacture" may be answered with the statement that it is expedient so far as the pharmacist may desire pleasure and profit from his business. The art of manufacturing perfumes by right belongs to the pharmacist, but it has drifted into the hands of specialists owing to the general impression that it is something mysterious and difficult. I assure you, however, that it is not difficult, and every pharmacist of ordinary intelligence should be able to supply his trade with goods equal to those produced by domestic or foreign specialists. The outlay required is small compared with the profits derivable from the investment. The essential oils and pomades required can be obtained from wholesale druggists, and in the desired quantities. The formulæ herewith presented have been in use by me for the past seven years, and may be accepted as reliable.

The term essence is used to denote the first washings from pomades, if preferred the extract surfin No. 24, prepared by Antoin Chiris Grasse will answer. It costs about the same as his huite surfine No. 24, which is the article intended when speaking of pomades.

The extract surfin is prepared by washing the pomade as directed for cassie but of course on a much larger scale. In point of economy the pomades are cheaper than the extracts because the second and even the third washings yield a nicely scented alcohol useful in cheaper grades of perfumes or in preparing cologne or toilet waters.

Tincture will denote a solution prepared from the crude material by percolation or maceration.

Spirit will denote a solution of an oil in alcohol.

Whenever any of these essences, tinctures or spirits are prepared

and kept on hand as stock solutions, they should be kept in a dark place and at a moderate temperature.

I have divided the subject into three parts, (1) a short description of each article and the mode of preparing the tincture, spirit or essence; (2) the amount and cost of material required; (3) a number of formulæ, with the cost of each. The materials entering into the manufacture of perfumes are obtained in different parts of the world, and from the vegetable and animal kingdoms.

ALCOHOL.

Procure the best cologne spirits or deodorized alcohol obtainable. Do not use common alcohol, as its odor is too strong and pungent for perfumers' use.

ALMOND (AMYGDALA AMARA).

Is a native of Persia, and Barbary, and is cultivated in Southern France and Italy.

Almond Spirit.

Oil of bitter	almondsdrops	80.
Deodorized	alcoholoz.	16.

AMBERGRIS.

This substance, which is found floating in the sea, or is thrown up by the waves upon the shores of various countries, is now generally believed to be produced in the intestines of the sperm whale. The best gray ambergris is quite expensive, but is the only one worth buying.

Tincture of Ambergris.

Ambergris	drams 2.
Powd. orris root	drams 2.
Dandoniand aloubal	07.16

Grind the ambergris and orris in a mortar until reduced to a fine powder; transfer to a bottle, and add the alcohol. Macerate for 30 days, and filter through paper.

BENZOIN (BENZOINUM).

Benzoin is imported from Borneo, Java and Siam. The tincture of benzoin has the property of adding permanence to some of the more fleeting odors.

Tincture of Benzoin.

Gum Benzoin, in fine powder......oz. 2.

Deodorized alcohol......oz. 16.

Macerate for 30 days and filter.

BERGAMOT (CITRUS BERGAMIA.)

The oil is obtained in Italy by expression from the peel of the fruit. It should be kept in a dark place and in a tightly corked bottle. If not well taken care of it soon loses its green color, becomes cloudy from a deposit of resin, and acquires a turpentine smell. Care should be taken to preserve all oils as above directed.

CASSIE (ACACIA FARNESIANA.)

Cassie is cultivated in Southern France and Italy, and produces a very valuable perfume, resembling violets, but stronger.

Essence of Cassie.

Introduce the pomade and alcohol into a Mason fruit jar of half gallon capacity. Digest by means of a water bath until the pomade is barely melted; shake well together, and repeat the shaking frequently until cold. Allow this to stand 30 days, then drain off the essence. If this falls short of one pint repeat with a sufficient quantity of alcohol to make up that measure. The washing can be continued and a second pint of essence obtained, which, although much weaker, may be found useful in a cheaper grade of perfumes.

CLOVE (CARYOPHYLLUS.)

The clove-tree is one of the most elegant trees found in the Moluccas and other islands of the Chinese seas. Clove is a leading feature in some of the fine bouquets.

Spirit of Cloves.

CITRONELLA (ANDROPOGON NARDUS.)

Oil of citronella is obtained by distillation from citronella grass, a native of Ceylon and India.

CIVIT (FROM VIVERRA CIVETTA.)

This substance is secreted by the civit cat. It is found in a large double glandular receptacle, between the anus and pudendum. The cat abounds in portions of Asia. Civit has a most disagreeable odor, but as a fixing substance, for giving permanence to the more fleeting odors, it is very valuable.

Tincture of Civit.

Civit dra	am 1.
Powd. orris root dra	am ı.
Deodorized alcohol o	z. 16.
Proceed as with tincture of ambergris.	

GERANIUM (PELARGONEUM CAPITATUM.)

Geranium oil is obtained in Southern France and Turkey, from rose leaf geranium.

Spirit of Geranium.

Oil of Geranium	oz.	I.
Deodorized alcohol	oz. 1	15.

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JASMINE (JASMINUM ODORATISSIMUM.)

Jasmine is cultivated in Southern France and Italy. Its odor is so peculiar and fine that it cannot itself be imitated, but is used for imitating odors of other flowers.

Essence of Jasmine.

Jasmine pomade	oz.	16.
Deodorized alcohol q. s. or	oz.	16.
Proceed as with cassie essence		

LAVENDER (LAVENDULA VERA.)

The best oil of lavender comes from Mitcham, in England, where the plant is grown extensively.

LEMON (CITRUS LIMONUN.)

The lemon tree is a member of the great citrus family. Sicily produces a large amount of oil of lemon. The raising and extracting of oils of lemon, orange and bergamot form one of the chief industries in the vicinity of Palermo. A good essence of lemon for

dispensing or for soda water syrups may be prepared as follows:

Oil of lemond	rams 4.
Carbmagnesia	" 4.
Sugar	" 4.
Deodorized alcohol	oz. 8.
Water	" 8.

Dissolve the oil in two ounces of alcohol; triturate in a mortar with the magnesia and sugar. Gradually add the remainder of the alcohol and water, and filter.

LEMON GRASS (ANDROPOGON CITRATUS.)

Is a species of grass growing in India; on account of its odor resembling verbena, the oil is used for preparing the extract of verbena.

MUSK (FROM MOSCHUS, MOSCHATUS.)

Musk is obtained from the musk deer, a small animal inhabiting the mountainous regions of Central Asia. Grain musk is the best form in which to purchase the article. Musk is used extensively in perfumes, both as a simple extract and for giving permanence to more fleeting odors.

Tincture of Musk.

Grain musk	drams	2.
Hot water	oz.	١.
Deodorized alcohol		

Rub the musk to a fine paste with the hot water. Digest in a covered mortar for 2 hours, add the alcohol, and transfer to a tightly corked bottle. Digest for 30 days and filter.

ORANGE (CITRUS AURANTUM. CITRUS BIGARADE.)

From the orange tree is obtained five distinct and valuable perfumes. Ist. The true flower odor, obtained by digesting the flowers with lard; 2d. Oil neroli petale or oil neroli bigarade, by distilling the flowers of the sweet and bitter orange respectively; 3d. Oil of neroli petit grain, by distilling the leaves and unripe fruit; 4th. Oil of orange Portugal, obtained by rolling the fruit in a metal cup covered with spikes, known as an equelle, which wounds the fruit and causes the oil to flow from the oil glands; 5th. Commercial oil of orange obtained by expressing or distilling

the orange peel. The orange tree is cultivated extensively in Southern France, Italy and Sicily.

Essence of Orange Flowers.
Orange flower pomade
Deodorized alcoholq. s. or oz 16.
Proceed as with cassie.
Neroli Spirit.
Oil neroli petale drams 4.
Deodorized alcohol oz. 16.
ORRIS (IRIS FLORENTINA.)
Is largely cultivated near Florence, Italy.
Tincture Orris.
Orris root pulverized
Deodorized alcohol, enough to make

PATCHOULY (POGOSTEMON PATCHOULI, LINDLEY).

Prepare by percolation.

Patchouly is a native of Silhet, a district of Bengal. It is also found in Java, Ceylon, and portions of China. The oil is distilled from the fresh herb. It has a very peculiar, musty, mossy odor; but when properly blended, forms a very fashionable perfume.

PIMENTO.

The allspice tree is a native of the West Indies, Mexico, and South America. The oil is obtained by distilling the berries.

ROSE (ROSA CENTIFOLIA.)

This is truly the Queen of Flowers, and although roses are found growing wild in nearly every part of the world, it is only in France, Turkey and India that they are cultivated for their perfume. The Turkish oil is the one commonly found in the market. Oil of rose should congeal at 80 deg. F. When slowly cooled to 50 deg. F. the oil becomes a transparent solid, interspersed with numerous slender, shining, irridescent scale-like crystals [U. S. P.] The oil is obtained by distilling the flowers with water.

Essence of Rose.

Rose pomade	oz. 16.
Deodorized alcohol q. s. or	oz. 16.
Proceed as with cassie essence.	

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Spirit of Rose.

Oil of rose	dram	s 2.	
Oil of rose geranium	. "	I.	
Deodorized alcohol	oz.	16.	
The oil of rose geranium is added to give perman	nence	to	the

ROSEMARY (ROSMARINUS OFFICINALIS.)

spirit.

The rosemary plant is a native of the borders of the Mediterranean Sea. It is also cultivated in this country. The oil is one of the leading ingredients in cologne.

SANTAL (SANTALUM ALBUM.)

The oil is distilled from the wood, which is a native of Australia and the South Sea Islands.

Spirit of Santal.

Oil of santal wood	, drams 2.
Deodorized alcohol	ozs. 16

TONKA (DIPTERIX ODORATA.)

The Tonka bean is the fruit of a large South American tree. When fresh they are very fragrant, having a strong odor of new mown hay. They are exported from Para and Angustura. Tonka beans are used for scenting snuff; and by unscrupulous dealers for adulterating vanilla, and in perfumery in the form of tincture they enter into many of the leading bouquets.

Tincture of Tonka.

Tonka beans	z. 6.
Deodorized alcohol, a sufficient quantity.	

Reduce the beans to a coarse powder; macerate in a corked bottle, with 16 ounces of alcohol, for 30 days. Then filter and add enough alcohol through the filter to make the product measure 16 ounces.

TUBEROSE (POLEANTHES TUBEROSA.)

The tuberose is a native of the East Indies. It is cultivated for its perfume in Southern France. Its odor is very fine and is a general favorite.

Essence of Tuberosc. Alcohol deodorized.....q. s. or oz. 16. Proceed as with cassie. VANILLA (VANILLA PLAINFOLIA.) Tincture of vanilla The best vanilla beans come from Mexico. is used as a fixing ingredient in some perfumes. Tincture of Vanilla. Vanilla beans......oz. 1. White sugar.....oz. 1. Cut the beans into small pieces. Beat with the sugar in a mortar until they are reduced to a coarse powder. Macerate with the alcohol for 30 days and filter. VIOLETS (VIOLA ODORATA.) A very delicate odor, but very fleeting; by the addition of some of the stronger properties a very fine and popular perfume is ob-Violets are cultivated in Southern France. tained. Essence of Violets. Alcohol deodorized......q. s. or oz. 16. Proceed as with cassie essence. VITIVERT, OR KUS KUS (ANDROPOGON MURICATUS.) Is the rhizome of an Indian grass. Spirits of Vitivert. Oil of vitivert drops 30. Deodorized alcohol..... YLANG OR IHLANG (CANANGA ODORATA.) This plant is found in the Phillippines and the islands of the Indian Archipelago. The oil is obtained by distilling the flowers. The perfume is very characteristic and lasting. Spirit of Ylang. Ylang oil.....drams 3. Deodorized alcohol......ounces 16.

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AMOUNT AND COST OF MATERIAL REQUIRED.

Quotations here given were received by me, July 24, 1884.	
Deodorized alcohol	12.00
Ambergris, best gray 1/8 oz. (1) 27.00	3.38
Oil of Bitter Almond½ " @ .50	.25
Oil of Bergamot4 " (t)	.40
Gum Benzoin	.12.
Cassie Pomade 1tb	2.25
Civit	.56
Oil of Cloves " "	.07
" Citronella "	.06
Jasmine Pomade 1th	2.25
Oil of Lemon 4 oz. (1.40 per 1)	
" Lemon Grass "	.10
" Lavender (Mitcham) "	2.50
Musk (best grain)	7.50
Oil Neroli petale " "	3.50
" " petit grain " "	.50
" Orange " @ 11.	•44
Orange Flower Pomade, Ifb	2.25
Oil of Pimento	.12
" Patchouly	.25
" Rose " "	9.00
" Rose Geranium "	.50
Rose Pomade 1th	2.25
Oil of Rosemary 2 oz. (1)	.20
" Santal "	.50
Tuberose Pomade ltb	2.25
Tonka Beans 8 oz. 2.00 per lb	1.00
Vanilla Beans "10.00"	2.50
Violet Pomade 1tb	3.00
Oil of Vitivert	.75
" Ylang	4.00

In the following formulæ if the perfumes are too expensive the ambergris can be omitted and civit substituted, except in extract of ambergris. The musk can also be reduced in strength one-half and still yield satisfactory results. In all cases secure the best goods, regardless of price. In perfumes as well as in medicines quality is of the first importance. When the perfumes are mixed they should be frequently agitated and allowed to stand for two or three weeks before filtering. Age improves all perfumes if kept in a moderate atmosphere and in a dark place.

Total.\$64.90

I. AMBERGRIS EX	CTRACT.
Spirit of roseoz. 3 Tincture of ambergris "8 Cost \$6.07 per pint. Where per recommended.	
2. ESS. BOUQU	ET.
Spirit of roseoz. 8 Tincture of ambergris " I " " orris " I Essence of cassie " I I Cost \$2.18 per pint. Essence of perfume, always popular.	
3. FRANGIPA:	NNI.
" " civitdrams 4 C	
4. ROSE GERANIUM	EXTRACT.
Oil of rose geraniumoz. 1 1 Cost So cents per pint.	Deodorized alcoholoz. 15
5· HELIOTRO	PPE.
" "ambergris" 1	Spirit of rose
6. HONEYSUC	KLE.
Tincture of vanilla " i	Tincture of toluoz. 1 " " musk " 1 Oil of neroli petaledrops 3 " bitter almond " 2 Deodorized alcohol oz. 1
42100 Per Pint.	

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7. JOCK EY	CLUB.
	Ess. of orange flowers " I Tincture of civit " 2 " musk " I ub has always had a large sale in the market.
Oil of lavender (Mitcham)drams 4	Deodorized alcohol " 14
	the common oil of lavender
9. LILY OF THE VALLEY O	OR WHITE POND LILY.
Essence of tuberose	Essence of rose
10 MILLEFLEURS (THOU	ISAND FLOWERS).
Spirit of rose	Tinct. of ambergris drams " of musk " 4 Oil of bitter almondsdrops " " neroli petale " 3 " " cloves " 3 " " bergamot " 120
II MUS	κ .
Tincture of muskoz. IT Spirit of rose	
12 NEW MON	WN HAY.
Tincture of tonka oz. 6 Spirit of rose 2 Essence of rose 2 " jasmine 2 Cost \$1.65 per pint.	Oil of neroli petale, drops 10 "rose geranium " 60 Deodorized alcohol oz. 4

13. NIGHT-BLOOM	
Spirit of rose	Tincture of civitoz. 2
Essence of jasmine 4 Tincture of tonka 2	Tincture of benzoin " 4
Cost \$1.65 per pint.	
14. ORANGE FLOW	ER EXTRACT.
Ess. of orange flowers oz. 12	Tincture of muskoz. 2
Essence of cassie" 2	
Cost \$3.20 per pint.	
15. РАТСИ	DULY.
Oil of patchoulydrops 75	Deodorized alcoholoz. 16
Oil of rose	
	y and rose geranium although
cheap in price are satisfactory to t	he trade.
16 SWEET	
Essence of tuberoseoz. 5	
	Tinct. of tonka " 1
Cost \$2.50 per pint.	
17 CLOVE	
Essence of roseoz. 6	Tincture of vanillaoz. 2
" " cassie " 4 Spirit orange flowers " 4	Oil of cloves drops 10
Cost \$2.40 per pint.	
18 RONDOL	KTIA
Tincture of musk drams 4	
Tinct. ambergris " 4	" clovesdrams I
Tinct. of vanilla " 4	" rosedrops 30.
Oil of bergamot " i	Deodorized alcoholoz. 14
Cost \$2.00 per pint. With con	nmon oil of lavender flowers it
will cost \$1.60.	
19 WHITE RO	SE NO. 1.
Spirit of rose oz. 8	Essence of jasmineoz. 4
Essence " " 3	Extract of patchouly " 1
Cost \$2.50 per pint.	
20 WHITE ROS	SE (NO. 2.)
Oil of rose drams 2	Essence of jasmine oz. 2
Oil of rose geranium drops 30	Tinct. of musk " 1
Essence of roseoz. 4	" " ambergris " 1
Deodorized alcohol "16	
Cost \$3.00 per pint.	

2I MOSS	ROSE.
Essence of orange flowers "3 of rose	Tincture of civitoz. I " musk" I
22 TEA	ROSE.
	Oil rose geranium drops 20
	erent products of the rose cannot
be recommended too highly. Th	•
23 SPRING F	
Essence of rose	Spirit of rose
24 TUBEROSE	EXTRACT.
Essence of tuberose oz. 15 Cost \$2.85 per pint.	Tinct. of ambergrisoz. 1
25 UPPER	TEN.
Tinct. of vanilla oz. 4 " " ambergris " 3 " " orris " 3 Spirit of rose " 3 Cost \$2.75 per pint.	Essence of orange flowers oz. 3 Oil of bergamot drops 90 " " lemon " 15
.26 VERB	ENA.
Oil of lemon grass, drops 50 " " lemon " 320 " " neroli petale . " 20 " " orange " 160 Cost \$1.90 per pint.	Essence of orange flowers oz. 3 " of tuberose " 3 Spirit of rose " 3 Deodorized alcohol " 6
27 VERBENA	(NO. 2.)
Oil of lemon grass drams 3	
28 V101	LET.
Essence of violets oz. 11 " " cassie " 2	Tincture of muskoz. I " orris 2
Cost \$3.00 per pint.	

violet (No. 2.)
Essence of cassieoz. 6 " " rose " 3 " " tuberose " 3 Cost \$2.05 per pint. The violets are always popular.
30 WOOD VIOLET.
Ext. of violets No. 2oz. 16 Oil of bitter almonds, drops 15 Cost 2.10 per pint.
31 YLANG YLANG.
Spirit of ylangoz. 8 Essence of jasmineoz. 2 " " roseoz. 4 Tincture of civitoz. 2 Cost \$2.70 per pint. This is my favorite; it combines fragrance and lasting qualities at a moderate price.
32 WHITE LILAC.
Essence of tuberoseoz. 12 Spirit of ylangdrams 4 Oil of bitter almonds drops 3 Tincture of civitdrams 4 Cost \$2.50 per pint.
To those who may wish to carry their study in perfumes and kindred arts further I can recommend the works of G. W. S.

To those who may wish to carry their study in perfumes and kindred arts further I can recommend the works of G. W. S. Piesse, D. I. Christiani, John H. Snively, and W. Saunders' article on perfumes read at the twenty-fourth annual meeting of the American Pharmaceutical Association.

The Specific Gravity Tables of the U.S. Pharmacopaia of 1880.

A. B. LYONS, M. D., DETROIT.

THE task of the critic, at best an ungracious one, is particularly thankless when the work under criticism is of a high order of That the committee to which was entrusted the work of revising our national standard have, on the whole, done that work admirably well is the universal verdict of all who have critically reviewed the result of their labor; and the United States can boast to-day of possessing perhaps the best Pharmacopæia in existence. That such a work, produced in any such manner, should be faultless is more than could be expected. To revise thoroughly an existing work, merely eliminating errors and inaccuracies of statement, and bringing up the technical portions to date of revision, is in itself a task so difficult that we are agreeably disappointed if the result is such as to challenge confidence and admiration; but when, as in the present instance, the entire work requires radical reconstruction, and when the new material must be drawn largely from periodical literature, and from personal experience and observation, we should be surprised if there were not many matters of detail which would have been modified had the committee been able to give them prolonged attention. In future revisions there will be opportunity to attend to these minutiæ, and future committees will be glad to profit by all criticisms whose aim is to secure greater perfection in every part of so important a work.

Statements such as those relating to solubilities, specific gravities, etc., collated from various authorities, could not of course be all verified without a greater expenditure of time than was at the command of the revising committee. The best they could do was to exercise discretion in the choice of authorities where statements were conflicting, and the wisdom of their choice in the majority of instances cannot be questioned.

Occasionally they would unwittingly aid in perpetuating an error which had already been widely copied, as when they gave the

specific gravity of oleic acid as 0.800 instead of 0.900, the mistake having arisen doubtless long ago, from a misprint, adopted however, without question into nearly all the text books. Errors, indeed, seem to have a strange tenacity of life, especially when pu in the form of authoritative scientific statements.

The specific gravity tables of the Pharmacopæia occupy no less than nineteen pages of the volume. One can see at a glance that the various tables have very unequal degrees of merit. No attempt has been made to reduce them to unity of plan, to prune them of redundancies, to supply deficiencies, or in any way to adapt them especially to the use of pharmacists. Compare, for example, the tables for solutions of potash and soda—the decimals carried only to three places, and gravities given only for 5, 10, 15, 20 per cent., etc.—with the succeeding table for ammonia, in which the decimals are carried to four places, and the intervals reduced from five per cent. to two-tenths of one per cent. Four-fifths of the figures in this table might have been omitted without impairing its value in the least, and for the sake of uniformity one would certainly wish that the standard temperature could have been changed from 14° C. to 15° C.

Before proceeding to a critical examination of the individual tables, however, let us endeavor to obtain a clear understanding of the perplexities and difficulties which embarrass this subject of specific gravities. The specific gravity of a body, any schoolboy will tell you, is the ratio of its weight to that of an equal volume of water. Simple enough, truly; how can there be misunderstanding of language so plain? Well, in the first place, there lurks ambiguity in that innocent word weight. Is it apparent or true weight that is to be understood? The difference is so trifling that in ordinary transactions and computations, even in the delicate operations of the analytical laboratory, we leave it habitually out of consideration; but in tables of specific gravity carried to four or five decimal places, it will make an appreciable difference in the figures, and cannot therefore be ignored. We are told that a litre of water at 4° C. (30.2° F.) weighs one kilogramme; but if we undertake to verify this statement, we find that, weighed at the temperature named, the water is found apparently wanting-the actual weight, according to the balance, is only 998.866, lacking

1.134 of a kilogramme. Why? For the same reason that a kilogramme of hydrogen seems to weigh 931 grammes less than nothing. In reality it weighs 931 grammes less than the air it displaces. What is so obviously true in the case of hydrogen is just as certainly true of the denser forms of matter. The true weight of any body weighed under the ordinary conditions of atmospheric pressure is its apparent weight plus the weight of an equal bulk of air. A pound of air, placed in the balances, unless confined under pressure, seems to weigh nothing; a pound of feathers is really heavier than a pound of lead.

The first question then to be settled in regard to any stated specific gravity is, Does the writer consider true or apparent weights? I have myself taken it for granted that the specific gravities given in text books are based on apparent weights under a standard barometric pressure of 30 in. (or 760 mm.); but the recently issued revised French Codex, quoting the familiar alcoholometric table of Gay-Lussac, explicitly states that these figures express the true density of the spirit in vacuo, and it is not at all probable that this is an isolated instance. The true specific gravity of absolute alcohol according to Gay-Lussac is 0.7943. is incorrect, but before comparing it with the specific gravity observed, we must reduce the true to apparent specific gravity, and we shall find that it then becomes 0.7941. The difference is small, yet sufficient to cause annoying discrepancies of statement, and in some cases, as e, g, that of strong sulphuric acid, sufficient to involve large errors in case of a misunderstanding.

Is is needless to say that for practical purposes a table ought to give apparent and not true specific gravities, although the corrected figures are of course the only ones admissible in scientifically exact tables.

But there is a more important source of disagreement among authorities in the circumstance that different units of comparison are in use in different countries, while the unit actually adopted in any case is rarely stated. When the nationality of the original authority is known, we can infer what standard is probably intended, but we shall even then be sometimes wrong in our conclusions. The unit of comparison adopted in England is water at 60° F. (15.67° C.), and Americans have generally followed the same practice.

On the continent of Europe, however, the unit is understood to be water at its maximum density, i. e. at 4° C. (39.2° F.). According to this standard, water at 60° F. has a specific gravity not of 1.000, but of 0.999072, while at 59° F. (15° C.) its specific gravity This latter temperature is that which the U.S. Pharmacopæia adopts as the ordinary standard temperature at which specific gravities are to be observed, and this standard seems likely to be universally adopted. It is to be preferred to 60° F. for the obvious reason that the degrees of the Centigrade and Fahrenheit scales coincide at this point in an integral figure. But, having adopted this as a standard temperature for observations of specific gravity, many have gone a step farther, and assumed as a unit of comparison water at the same temperature. Personally, I must pronounce my judgement as strongly in favor of this practice. One cogent reason for the preference is that all pycnometers and hydrometers, in this country at least, are constructed on the assumption that water at the standard temperature has a specific gravity of 1.000. The obvious advantage of such a construction is that it enables any one to verify at once the correctness of the instrument, at least for one point. The hydrometer must sink to the zero of the scale in distilled water at the standard temperature. The pycnometer must hold at the standard temperature exactly 10, 50, or 100 grammes, as the case may be, of distilled water. In case water at its maximum density is taken as the unit of comparison, we shall have to refer to our tables, unless blessed with a phenomenal memory for figures, to ascertain what should be the reading of the hydrometer in distilled water, or what weight of the same fluid the pycnometer should hold.

Granting that the proper correction to be made is easily remembered, the necessity of making such a correction at all complicates needlessly the operation of taking a specific gravity. This is especially true when one attempts to take a specific gravity with an improvised pycnometer which does not hold exactly 10 or 50 or 100 grammes. It becomes necessary not only to ascertain how much water it actually does hold, but to calculate the weight of an equal volume of water at maximum density. The worst of it is that this is all labor lost. The man who constructs a table, laboriously correcting his observations, not only runs the risk of introdu-

cing inaccuracies into his work, but compels every one who subsequently employs the table to make a corresponding correction of each and every observation, with a risk again of introducing inaccuracies into his result. I hold that for practical use tables like these should be made up of the uncorrected results of observation.

That corrections such as I am speaking of are actually confusing even to the trained physicist, is abundantly illustrated in the tables of the Pharmacopæia.

An additional reason for choosing as the standard of comparison water at the same temperature as that at which the observation is made, is that this reduces to a minimum errors arising from inaccuracies in the thermometers employed; for the specific gravity of even a fluid having a large coefficient of expansion does not vary very greatly within a range of a degree or two of temperature, provided the comparison is made with water at the same temperature, whereas, if a fixed, absolute standard be assumed, even a slight variation in temperature introduces a notable inaccuracy into the results obtained.

If custom, however, shall fix as the unit of comparison, water at its maximum density, we must employ a pycnometer which at 59° F. (15° C.) holds, not 100 grammes, but 85 milligrammes less than this; or if the specific gravities are to be taken at 60° F., it must hold 93 milligrammes less than 100 grammes. Suppose, however, that the pycnometer actually holds at the standard temperature (59° F.) 100 grammes of water, we shall have to reduce all observations to the absolute standard by applying a correction, which will amount to 0.00085 multiplied by the specific gravity observed, and which will be in every case subtractive. Example: Uncorrected specific gravity, 1.03472. Correct by subtracting 0.00085x1.035 =0.00088.

There is still one other important correction that must often be made in order to obtain the true from the observed specific gravity. This is the temperature correction due to the expansion of the glass instruments employed. The capacity of a pycnometer is greater at 15° C. than at 4°, consequently, if the instrument be correct at the latter temperature, it will hold too much at the former. This is the reason why it is not possible to test a pycnometer, to be used at 15° C., by simply weighing it, filled with water at its maximum density (i. e. at 4° C.) If the instrument were correct at 15° C., we should find that at 4° it held, not 100 grammes, but 99.972. The capacity of the 100 gramme flask is increased for each 1° C. by 2.6 milligrammes, or for 1° F. by 1.4 mg.

It is often difficult to bring the temperature of a fluid to the standard to take its specific gravity. With the ordinary pycnometer it is next to impossible in summer to obtain accurate results, if we attempt to do so. The condensation of moisture on the outside of the flask, if brought to the required low temperature, and the loss of fluid by evaporation from expansion during the weighing, to say nothing of the difficulty of maintaining a constant temperature in fluid and flask during the operation of filling, are difficulties which practically are often nearly insurmountable. It is better always in such cases to take the apparent specific gravity of the fluid at the temperature of the air, and to correct the figure thus obtained by the aid of data furnished by appropriate tables. Dr. Squibb advocates the use of a double standard in recording specific gravities, observations being taken respectively at 15° C. (59° F.) and 25° C. (77° F.), and the suggestion is worthy to be adopted. A still better plan would be to state the specific gravity as usual at standard temperature, and append a temperature correction for one degree (C. or F.) to be applied in case observations are made at a somewhat higher or lower temperature. In Dr. Hoffman's work on the Examination of Medical Chemicals, such corrections are introduced in connection with all the specific gravity tables; but the data are not as complete as they should be, and the figures given represent true and not apparent expansions. The true expansion is of course the apparent expansion plus the expansion of the glass instrument-0.000026 for each degree Centigrade. Since the original figures must be restored before employing the corrections, it would seem better to give simply apparent expansions.

The correction may take another form. The strength of a solution corresponding with the observed specific gravity (apparent) may be sought in the table, and this figure may then be cor-

rected by a coefficient previously calculated, multiplied by the difference between the standard temperature and the actual temperature of the fluid under observation. Such a coefficient I had already introduced into the accompanying tables; I now find that the alcoholometrical table of the revised French Codex has adopted independently the same plan, confirming me in my belief in its utility. A given spirit shows at 19.5° C. an apparent strength, by the alcoholometer, or by the uncorrected indication of the pycnometer, 50 per cent. (volume) of absolute alcohol. The table gives as coefficient for temperature 0.37 per cent. 4.5xo.37:1.67 to be subtracted from 50 per cent. The spirit contains, therefore, 48.33 per cent of alcohol.

We turn now to a brief consideration of the tables of the Pharmacopæia. The first of these tables—that relating to alcohol has already been made the subject of several criticisms. writer has on a former occasion expressed somewhat fully his views as to its shortcomings and its redundancies. The general subject has also been very recently reviewed in an able manner by Dr. Squibb (Ephemeris, May, 1884), so that it will be sufficient here to present very briefly the principal points of criticism, pro and con. The table adopted by the Pharmacopæia is that of Hehner, based evidently upon the well known table of Fownes. This differs from all the tables in common use in that it assigns to absolute alcohol very nearly its true specific gravity, viz. 0.7938, whereas other authorities give figures considerably higher than Thus Tralles (reduced to the same basis for comparison) makes it 0.7943, Gay-Lussac 0.7946, and Stampfer 0.7947. Of course an error in this fundamental constant must affect all the figures in the table, those most which correspond with the higher percentages of spirit. This circumstance alone would naturally lead to the adoption of Fownes' table, especially when its history was known. Fownes obtained his figures by carefully performed synthetical experiments. Every alternate term in the table is the result of a direct determination, the remaining terms being supplied by interpolation. Hehner's table is simply an amplification of that of Fownes, with deviations at two points only; one of these evidently intended to bring the table into harmony with the value which careful determinations have given for proof spirit, the

4 1

other probably for a similar reason. The actual differences are as follows:

		Fownes.	•.	Hehner.
47	per cent			0.9248
48	"	0.9228		0.9226
49	"	0.9206		0.0204
50	"	0.3184		0.9182
51	"	0.9160		0.9159
91	"			0.8200

Hehner's table is needlessly diffuse. It is easy to supply by interpolation the terms corresponding with fractional percentages; and in a table which admits probable errors of one-fifth of one per cent., it is absurd to pretend to discriminate fractions as small as one-thirtieth of one per cent. A table covering two pages could easily be constructed which would be at least equally accurate in its figures, and which certainly would be more convenient for reference. That Fownes' table is far from perfect is evident from a study of its intervals, which exhibit a capricious irregularity that certainly has no counterpart in the physical facts. We must look upon the table as merely a record of numerous independent observations, each subject to its own error; in a perfected table errors like these should be eliminated—made to correct and neutralize one another by a process of equalization of intervals.

Perhaps the simplest way of accomplishing this is by the graphic method, which, by way of illustration, we may apply to the first portions of Fownes' table. (See diagram.) We draw a number of equidistant horizontal lines, numbering them respectively 0, 1, 2, 3, etc. Crossing these at right angles we draw a similar series of co-ordinate lines, dividing the field into exact squares. These lines correspond with the specific gravities marked at top and bottom. We now mark on the horizontal line one the point corresponding with sp. gr. 0.9981, from the table, on line two sp. gr. 0.9965, and so on. We now draw by the aid of a flexible ruler a curve, which coincides as nearly as possible with the points which have been laid down. The intersections of this curve with the horizontal lines will give us corrected or equalized values for the specific gravities of the table. In the illustration it is evident that the point on line 2 is quite out of the curve to which the

others pretty closely correspond, and this figure in the table must be changed to 0.9964. As the result of such a process, whether conducted by a graphic method or by purely mathematical calculations, the table, based at first on observations, should be *idealized*. Of course the results of this process must stand the test of experimental verification before they are accepted as final. Hehner has simply amplified Fownes' table, without any attempt at idealizing it, except at the two points already mentioned, where additional reasons had weight. The fixed points laid down by Fownes under a limitation of four decimal places are simply connected by straight lines, with no pretence of rounding out the curves.

Of the various alcoholometrical tables in common use, which is, on the whole, most nearly correct? Or are they all so hopelessly erroneous that they must be supplanted by one yet to be constructed? Dr. Squibb summarily dismisses all the tables with the exception of that of Fownes-Hehner, quoting Mendelejeff as declaring that their numerous grave errors place them beyond the pale of rational criticism. Perhaps it is true that from the standpoint of science we must ignore the painstaking work of these men, but it is just possible that we may have attributed to them blunders of which they were not guilty; and at all events it is certain that their tables rest upon the basis of observations which, if not conducted always in the most scientific manner, are not without practical value, especially as a check upon the observations of others. only difficulty is that we do not know how far these tables represent independent observations, or how far they have copied one from another, or drawn their facts from a common source.

Dr. Squibb, in attempting to show how erroneous were some of the conclusions of these men—quoting himself from contradictory authorities—shows how difficult it is to decide as to the correctness of mathematical calculations where only results are given without details of the processes, or of the data. Thus on page 525 of the *Ephemeris* we are told that "Gilpin's researches brought the specific gravity of anhydrous alcohol to about 0.7939 at 15.6° C. (60° F.) compared with water at 4°." On the succeeding page the statement is made that "Tralles deduced from Gilpin's researches a specific gravity for anhydrous alcohol of 0.7939 at 15° C. (59° F.)

compared with water at 4°, which was nearly correct from his data. As the equivalent to this he gives, for a temperature of 15.6° C.—water at the same temperature taken as standard of comparison—0.7946. He should have deduced the value 0.79411." If the first statement of the deductions to be drawn from Gilpin's researches is correct, Tralles conclusion, based ultimately upon it, is not far wrong, and it is easy to understand how a misprint might have occurred in the second statement, which Tralles placed on record, but for which he had no further use.

In like manner, I am loth to accept the bare statement that the tables of Gay-Lussac are "pervaded by certain errors," until I am certain that I understand precisely what assumptions that distinguished physicist really made the basis of his calculations. Dr. Squibb does not intimate that Gay-Lussac's figures are given as true densities, in vacuo, yet such now appears to be the fact; of course it is impossible to approve or condemn his results without a full understanding of them.

In whatever way it came about, however, it is certain that all these authorities assigned to absolute alcohol too high a specific gravity, and this circumstance necessarily vitiates their work; to an extent, however, not easy precisely to determine.

The first step towards solving the problem I had in hand, was to bring into comparison, figure by figure, the several alcoholometrical tables in general use. This was a task of no small magnitude, since the different tables adopt different standards of temperature and different units of comparison, and we are not in any case informed whether the figures given represent true or apparent specific gravities. In the table of Tralles, the standard temperature is 15.6° C. (60° F.), but the comparisons are made with water at its maximum density. In the tables of Gay-Lussac and of Stampfer, the standard temperature is 15° C. (59° F.), while water at the same temperature is taken as unity. In Fownes' table the standard temperature is 15.6° C. (60° F.), water at the same temperature being taken as the unit of comparison. I have reduced all these tables to this last standard, which is that most in use among English speaking people. In addition to these tables, I have given the original figures obtained by Gilpin, assigning them as nearly

as possible their true value on the assumption that anhydrous alcohol has a specific gravity of 0.7935, bringing them thus into comparison especially with the figures of Dr. Squibb. These figures have an unquestionably high value, and, although incomplete, serve to point out with tolerable certainty the more considerable errors in the other tables. My next task was to construct an independent table of my own. Although not provided with all the facilities for work of this kind, I obtained results which could not vary greatly from the truth. The plan I adopted was essentially the same as that pursued by Fownes. I did not, however, attempt to make my mixtures with absolute alcohol, 'nor did I rigorously exclude air from the spirit and the water employed in my experiments. I reasoned that for practical purposes a table ought to be constructed under conditions analogous to those which would be met with in practice; the mixtures which will be tested for their alcoholic strength by their specific gravity will not be free from air; hence in experiments having in view practical rather than scientific ends, it will be better to allow the presence of such proportions of air as will be likely to occur in specimens of spirit we shall have to examine. Absolute alcohol is so volatile, and so greedy to absorb moisture from the air, that extraordinary precautions must be taken in a series of experiments, like those of Fownes, in which it is employed. I therefore made a few mixtures only of absolute alcohol (sp. gr. 0.7938 at 60° F.) with water, including one corresponding closely with the 90 per cent. (commercial) alcohol employed in the remainder of the mixtures. I made about thirty mixtures, of which I determined the specific gravity with care, and from these observations I constructed a table which I have collated with the rest under the heading, "Observed." addition to these tables, I find one given by Allen (Commercial Organic Analysis, (which, while based for the most part on that of Fownes, exhibits some instructive variations, particularly in the first portion of the table, where the figures coincide closely with those of Tralles.

Allen gives:

1	per	cent	0.99813
2			0.99628
3			0.99454

4	per cent	 0.99284
5	- "	 0.99122
		 0.98964
7	46	 0.98813
8		 0.98668
9	. "	 0.98527
9	٠	 0.98388
ΙI	"	 0.98280

He also introduces into his table a value for proof spirit (0.9984) which has the anthority of legal enactment, but which is at variance with contiguous figures. Hehner, we have seen, modifies the other figures to bring them into harmony with this.

After I had completed the task of collating the principal alcohol tables, Dr. Squibb published the results of a valuable series of independent observations, which I have brought into comparison with the rest. The appliances which Dr. Squibb had at command were so much superior to my own that his results must be admitted to have a higher absolute value than mine. He has succeeded, moreover, in eliminating from his anhydrous alcohol a small residuum of water which has eluded the search of previous investigators, and he consequently gives now as the specific gravity of absolute alcohol 0.7935 at 15.6° C. I had followed the authority of Fownes, Drinkwater, and other recent observers, in giving it a value of about 0.7938. It is possible, however, that these authorities may intend to state the true density (in vacuo) of absolute alcohol, and if so there is not a great difference after all between Dr. Squibb and his predecessors. Reduced to vacuum weighings, Dr. Squibb's figure becomes 0.7937.

It will be observed that, although Dr. Squibb defends Fownes' table with its irregular intervals, on the ground that it gives simply the original observations of a careful physicist with no attempt at idealizing—"cooking," he calls it—yet his own figures correspond in the regularity of their intervals much more closely to those of Tralles than to the erratic ones of Fownes-Hehner.

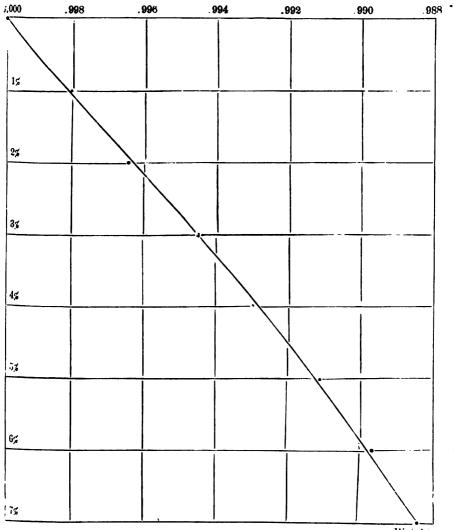
The data furnished by Dr. Squibb's observations, in addition to those obtained by myself, and checked by those of Gilpin, Fownes, and others, seemed to me sufficient for the construction of a tolerably correct and accurate table of apparent specific gravities for alcohol of different degrees of strength. In the first place I have

calculated as well as I could the average results from observations of Gilpin, Fownes, Squibb, and myself, placing them in the comparative table. I have thought best, however, not to use these averages as the basis of the corrected tables herewith offered, but rather in these to give preponderating weight to the figures of Dr. Squibb. I have not made use, moreover, of any of the older tables, in the first place for the reason that these nearly all assumed an erroneous figure for the specific gravity of pure alcohol, and in the second place because I could not be sure whether in these tables true or apparent specific gravities were intended.

I have given decimals to five places as obtained in the observations; of course the fifth decimal cannot be relied upon, and in tables for practical use could as well be omitted. The first step in constructing a table like this is to reduce all observations to vacuum weighings. This will slightly increase the proportion of absolute alcohol in the mixtures, since alcohol loses more relatively than water when weighed under the ordinary atmospheric pressure. Having thus corrected the figures expressing specific gravities, and obtained from these the true densities, we are ready to construct a table of volume percentages.

This is done by multiplying the figure expressing per cent. by weight by the density and dividing the product by the density of absolute alcohol. The quotient is the per cent. by volume corresponding with the given weight percentage. I have introduced these figures into my table, because it is often desirable to convert directly percentage by weight into percentage by volume, and vice versa.

Apparent specific gravities I have given for the temperature of 60° F. [15.6° C.], since alcohol tables have heretofore been generally calculated for this temperature. For the sake of uniformity, however, it is desirable that the standard temperature be brought to 59° F. [15° C.], and these figures I have calculated. While I strongly prefer myself, for reasons I have already explained, to employ as a standard of comparison in all specific gravity tables, water at the standard temperature, I know that many will disagree with me on this point, and hence I have given also figures in which water at its maximum density is taken as unity. These data may



Weight %

Diagram referred to on pages 155 and 156.

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•	·		
		•	
	•		
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be of service to any one who in the future wishes to construct an alcohol table. I have, however, endeavored myself to supply in addition to the above data an ideal table, at once compact, comprehensive, and accurate. Future observations may modify some of the figures, but while such modifications are doubtless required for scientific exactness, they will affect commercial values very little, and no tables can be constructed which will not in practice give inaccurate results, with the imperfect appliances which of necessity must be employed in determining specific gravities.

The "ideal" table gives specific gravities corresponding with percentages from one to one hundred of absolute alcohol by weight, of absolute alcohol by volume, and of commercial alcohol (U.S. P. standard) by volume. Temperature corrections are given for each of these, expressed in percentages; also percentage differences corresponding with a difference in specific gravity of 0.0001. illustration will suffice to show how the table is to be used. specimen of dilute spirit is found to have at 72° F. an apparent specific gravity of 0.9732 (water at 60° F.—unity). Required the percentage by weight of absolute alcohol. The nearest figure in the table is 0.97396, corresponding with 18 per cent. 0.00076 less than the observed specific gravity; the table gives, as correction corresponding to 0.0001, 0.083. We must therefore add 0.082x7.6=0.631, making 18.631. The temperature correction is 0.166 for each degree Fahr., and since the temperature is 12°above standard, we shall have to subtract 12x0.166=1.992 from 18.631, giving us as a final result 16.639 per cent. as the strength of the spirit. The extreme probable error in the figures of this table I think do not in any instance exceed one tenth of one per cent.— a degree of accuracy which certainly has never heretofore The percentages are probably a trifle high been attained. between 30 and 40 percent and again between 50 and 65 percent and low between 65 and 85 percent. Except in the first of these however I have adhered pretty closely to Dr. Squibb's figures.

In glancing over the remaining specific gravity tables of the Pharmacopæia, we observe a great diversity of plan. The table for acetic acid, by Oudemans, which stands first on the list, is an admirable piece of work. The specific gravities are given for temperatures of 0°, 15°, and 40° C., the standard of comparison in

each case being water at maximum density. For practical purposes, however, the first and third columns of the table are superfluous; it is enough to give specific gravities at the ordinary standard temperature (15° C.), together with the coefficient (apparent) of expansion by heat; or, better still, a column of corrections such as I have already described. Considerable space would be saved by condensing all the acid tables into one, but this would of course necessitate reducing them all to a uniform plan. This work also I have attempted, and I take pleasure in presenting with this paper the result of my work—regretting only that it could not have been exhaustive so far as this portion of the subject is concerned.

I have given no particular study to the table for hydrobromic acid, which, however, is of comparatively little importance—although it is one of the very few specific gravity tables that have been introduced into the new French Codex. The unit of comparison in this table, which is by Biel, is water at 15°C. Dr. Squibb states that he has found some of the figures of the table quite erroneous, and there is an apparent inconsistency in the intervals just at the end of the table. I have made a single verification only, of an acid of about the officinal strength, and in this instance the figure given in the table proved nearly correct.

The tables for hydrochloric, nitric, and sulphuric acids are evidently intended to give specific gravities corresponding with the degrees of Baume's hydrometer, although there is no intimation of this in the text, and the figures in the several tables do not exactly correspond. A column should have been added giving degrees according to Baume, or else the figures should have been reduced to even percentages. It is not quite clear what unit of comparison the author of these tables intended to adopt. If it were water at maximum density, the starting point of each table (i. e., the zero of the Baume's scale or the specific gravity of water at the standard temperature) should be 0.9992. Instead of this we find that in the table for hydrochloric acid it is 0.9995, in that for nitric acid it is 0.0000, while in that for sulphuric acid it is 0.003. The first two are not so far out of the way, considering the fact that the decimals in these tables are carried only to three places although the fractional quantities given in the column of percentages practically extends the number of decimals to four-but no ingenuity of mine can find an explanation for the wholly anomalous figure given in the third.

The tables for nitric and sulphuric acids agree closely, except in the first few terms, with the figures given by other authorities, starting generally with water at 15 C. as 1.000; in the case of hydrochloric acid, a similar agreement prevails throughout the table.

There are a few erroneous figures given, whether errors in proof-reading, or simply copied from the accepted authority, I am unable to say. In the table for hydrochloric acid 41.7 per cent. (at o C.) should be 40.7. In the table for nitric acid 1.2 per cent. at o should read 2.2. In the sulphuric acid table specific gravity 1.540 should read 1.546. Besides these obvious misprints, there are a few places where the figures probably should be corrected, but in the main they seem to be fairly accurate.

The tables for hydrochloric and nitric acids give specific gravities for 0° and 15° C. It would appear that in the former of these tables the second column gives uncorrected specific gravities, taken with a pycnometer adjusted for use at 0° C., while in the latter the correction for expansion of glass is applied.

In the nitric acid and sulphuric acid tables, percentages both of acid and of anhydride are given. The latter would seem to be superfluous, now that chemists no longer regard the anhydride as in any sense an acid. For the sake of completeness factors might be given in connection with the tables for converting the percentage of anhydride to percentage of acid, and vice versa..

The sulphuric acid table very properly omits the column giving specific gravities at 0°, but on the other hand professes to give the quantities of sulphuric acid and sulphuric anhydride respectively contained in one litre of a given acid. It assumes incorrectly that a litre at 15° C. contains 1,000 grams of water. In fact it contains only 998.08 grams, weighed in the air. Hence the figures given are throughout erroneous, unless the word litre is taken to express correlation of weight with volume. For practical purposes these figures are superfluous, or if required for any purpose may be readily obtained by simply multiplying together the figures in the preceding colums of specific gravity and percentage. It would be much more to the purpose to state in grains the weight of a fluid ounce of the acid, and the weight of actual acid contained in it, and

to give a column of specific volumes in this and other tables; but it would be easy to extend tables like these indefinitely, if the attempt be made to include all the data which one has frequent occasion to employ in practice. Instead of including these, however, in the several tables, I have thought it better to relegate them to a table by themselves, avoiding thus much repetition of figures.

The table for phosphoric acid is by Schiff, and is a good practical table, carried to four decimal places. The intervals are very regular, and careful verification of a number of the figures shows that they are substantially correct. The standard of comparison in this table is water at 15° C. The table ends abruptly at 60 per cent., which is unfortunate, since an acid of considerably greater strength than this is frequently met with in commerce. Whether there is a difference, or at least any considerable diference, between solutions of ortho-pyro- and meta-phosphoric acids containing the same quantities of phosphorus is a question of interest in this connection. If there is, it would be impossible to decide by specific gravity alone the strength of a given specimen of acid.

A column is added in this table giving percentages of phosphoric anhydride corresponding with those of phosphoric acid. An erroneous factor, 0.726, is however assumed for calculating the figures in this column, which are all consequently too large. The correct factor is 0.7245. To make matters worse, an additional error has crept into the calculations, which adds to each of the last 15 terms in the column 0.1. This table, including these very obvious errors, has been copied into the new edition of the French Codex—another illustration of the immortality of blunders.

The tables for potash and soda, taken also from Schiff, are very meagre. They agree in the main, so far as they go, with those of Gerlach given in the National Dispensatory. I have collated these with tables by Dalton and by Tunnermann given in Fresenius' quantitative analysis, and I find the discrepancies quite irreconcilable. Doubtless some of the observers used a very impure alkali, and some of them appear to have evolved their tables chiefly from their inner consciousness. In Tunnermann's table for soda the intervals change abruptly at a certain point in a most improbable manner. The wide difference shown in some of the tables between the weaker solutions of potash and those of soda, which

is represented as diminishing in the stronger solutions, attracts attention. Does it exist in fact? Some observers give to the weak soda and potash solutions of corresponding percentage strength nearly the same specific gravity. It is evident that these particular tables require thorough revision. Fresenius gives, side by side, the figures of Dalton and of Tunnermann, without giving preference to either, or even intimating that they are not in substantial agreement. I have simply brought the tables into comparison, showing what different and incompatible results different observers have reached. A few experiments have sufficed to show that there really exists a great difference in specific gravity between soda and potash solutions, but not so great probably as some of the tables show. I have not had the time, however, to pursue the subject.

An unusually elaborate table is given for ammonia, from Carius, the decimals carried to four places and percentages to fifths. The table is calculated for 14° C., water at the same temperature being taken as the standard of comparison. Although the figures of this table differ materially from those of Otto, quoted by Fresenius, and still more from those of Griffin and of Ure, which are often quoted, they are self consistent and are not grossly incorrect. I find however, that the figures require some emendation, and the table should be recalculated for a temperature of 15° C., to bring it into harmony with the remaining specific gravity tables of the Pharmacopæia.

In the accompanying tables, I have collated the various specific gravity tables given in standard text-books. I have not been able to learn much of the history of the several tables, but it is evident that they are of very unequal degrees of merit. I have constructed independent tables for hydrochloric, phosphoric, and sulphuric acids; of these the first is very nearly correct throughout. That for phosphoric acid was based upon a smaller number of original observations, and covers only the ground of Schiff's table, with which it is in pretty close accord in the main. In my work on sulphuric acid, which presents peculiar difficulties, I was frequently interrupted, and I labored under various disadvantages, which altogether make me less confident than I should otherwise be of the correctness of my figures, particularly as they differ materially

in some portions of the table from those of Ure, Kolb, etc. The very high coefficient of expansion of acid of 65 to 85 per cent. strength seems extraordinary, and requires verification. The observations from comparisons of which some of these data were deduced were made at different times and with different apparatus, so that errors of considerable magnitude may have crept in. It is certain, however, that the coefficient of expansion of the strongest acid is lower than that of an acid somewhat dilute, as it is certain, according to various observers, that at 15° C. acid corresponding to the formula H. SO₄ has a specific gravity lower than either a stronger or a slightly weaker acid.

Finally I have brought together the results of these researches in the form of a condensed table, which embraces all the U. S. P. tables except those for alcohol, hydrobromic acid, potash and soda. In the case of nitric acid, I have used the figures of Kolb in the main; all the others are those obtained in my own observations. It will be noticed that for sulphuric acid of over 90% or for acetic acid of over 50%, the specific gravity varies too little or too capriciously to admit of an accurate determination of the strength by this means alone.

Experimental researches, such as those of which I bring to this Association the meagre fruits, consume a great deal of time, and require for their satisfactory performance continuous application which only men of some leisure can devote to them. The contributions which I have been able to make to this branch of scientific research are in themselves of comparatively little value, but they may stimulate others who can command more leisure, better appliances, and greater skill to do work which shall greatly enlarge the world's fund of useful scientific knowledge.

Detroit; Sept. 3, 1884.

CONDENSED ALCOHOL TABLES.

Water at 60 F. (15 G C)-1.00000.

	Per Cent. Abso- late Al- cohol by Weight	Sp. Gr. at 60° F. (15.6° C.)	Differ- ences.	Correc- tion for Differ- ence in Sp Grav- ity of ,0001,	Correction for 1° F. above or below 60°	Per Cent. Abso- Inte Al- cohol by Weight	Sp. Gr at 60° F. (15.6° C)	Differ- ences.	Correction for Difference in Sp. Gravity of ,6001,	C-rrec- tion for 1° F. above or below 60°
	o i	1.00000	ļ			l				
	1	.99814	168	.054	.054	51	.91589	222	.045	.189
ļ	2 '	634	180	.056	.056	52	366	223	.045	.189
	3	460	174	.058	.058	53	141	225	.045	.188
	4	291	169	.059	.060	54	909:6	225	.045	.187
	5	127	164	.061	.063	55	691	225	.045	. 187
	6	.98969	158	.063	.067	56	465	226	.044	.188
	7 1	816	153	.066	.073	57	240	225	.045	.188
	 8 i	668	148	.068	.079	58	015	225	.045	.189
	9	525	143	.070	.086	59	.8979	225	.045	.159
	10	387	138	.072	.095	60	563	227	.044	. 190
	11	254	133	.075	.105	61	335	228	.044	.188
	12	127	127	079	.115	62	104	231	.043	.186
	13	003	124	.081	.124	63	.88871	233	.043	.184
	14	.97882	121	.083	.133	64	634	237	.0.2	.183
	15	761	121	.083	.142	65	892	243	.041	.182
	16	639	122	.082	.150	66	150	243	.041	.183
	17	517	122	.082	.158	67	.87907	243	.041	.181
	18	396	121	.083	.166	68	666	241	.042	. 185
-	19	274	122	.082	.175	69	425	241	.042	.185
•	20	151	123	.081	.184	70	184	241	.042	.186
	21	026	125	.080	.190	71	.86945	239	.042	. 186
	22	.96898	128	.078	.195	12	708	237	.012	.186
	23	768	130	.077	199	73	470	238	.042	.186
	24	635	133	.075	.203	74	230	240	.042	. 185
	25	499	136	.073	.205	75	.85989	241	.042	. 185
	26	359	140	.071	.207	76	748	241	.042	. 185
	27	216	143	.070	.200	77	506	242	.041	.184
	28	069	147	.068	.211	78	263	243	.041	. 183
	29	.95918	151	.066	.210	79	018	245	.041	.182
	30	761	157	.064	.208	80	84772	246	.041	.181
	31	599	162	.062	.204	81	526	246	.041	.180
	35	431	168	.059	.200	82	276	250	.040	. 179
	33	259	172	.058	. 197	83	025	251	.040	.179
	34	082	177	.056	. 195	84	83774	251	040	.178
	35	.94901	181	:055	.194	85	522	252	.040	. 178
l	36	716	185	054	.193	86	269	253	.040	.177
	37	527	189	.053	.192	87	013	256	÷03 9	. 175
	3.	333	194	.052	.191	88	.82753	260	.039	.174
	39	136	197	.051	. 191	89	490	263	.038	. 172
	40	.93936	200	.050	. 191	90	224	266	.037	. 170
	41	734	202	.050	.190	91	81955	269	.037	.168
	42	529	205	.049	.190	93	683	272	.037	. 166
	4 3	322	207	019	.190	93	408	275	036	. 163
	44	112	210	.048	.190	94	129	279	.036	. 161
	45	.92901	211	.047	. 190	95	80 45	284	.035	. 158
	46	687	214	.047	. 190	96	556	289	.035	.156
	47	471	216	.047	.190	97	263	293	.034	. 154
	49 19	253	218	.046	.190	98	79967	296	.033	. 152
	50 I	(133	220	.046	190	99	667	300	.038	.150
	, III	.9:811	222	.045	. 189	100	350	317	.032	.142
				<u>'</u>		·				

Nitric Acid.

Per cent. H N O ₃	According to Ure at 15° C.	According to Kolb at 15° C.	According to Kolb at 0° C.	Differences.	Expansion apparent for 1° F.	Per cent. of N ₂ O ₅
0	1.0000	.9989 (?)	1.00000			
1 .	1.0057	1 0.45	1.00636	57	.00009	.857
3	114	102	1273	57 58	10	1.714 2,571
4	171 230	163 220	1983 2582	57	1 12	8.429
5	230 236	284	8250	58	ji ii	4.286
G	349	843	3890	58	16	5.143
7	400	403	4585	59	18	G 000
8	458	468	5900	60 60	20 22	6.457
10	515 579	520 587	5867 6560	60	21	ს.571
11	639	647	7283	60	26	9.429
์ เรีย	701	707	7900	61	29	10.286
13	761	768	8567	61	31	11.143
14	8:25	830	0558	63	83	12 (00
15	886	892	9871	61	34	12.857
16	948	952	.10583 1200	62 62	36 38	13.714 14.571
17 18	. 1009 076	.1013 080	1878	62	40	15 429
19	142	137	2560	63	42	16.286
ซีบ์	203	199	3565	63	44	17.143
21	268	263	4067	63	46	18 000
55	331	827	4578	64	48	18.857
23	347	391	5269 5962	64 64	49 50	19.714 20.521
24 25	451 525	458 526	6633	65	50	21.429
26	589	591	7308	65	51	22.286
27	653	657	8000	66	59	23,143
25	717	723	8667	66	52	24.000
29 30	781 846	787 853	9346	66 66	53 54	24.757 25.714
			1	65	55	26 571
31 32	914 986	920 084	0731 1388	0.5 66	56	27.429
33	.2055	2048	2036	66	56	28,286
34	123	113	2700	66	57	29,143
35	190	178	8375	66	58	30 000
36	261	2 43	4063	65	58	30.857
37	327	810	4733	66	59 59	31.714 32.571
39	390 4 55	378 445	5393 6036	66 67	59	23,429
40	519	508	6730	66	60	34.236
41	583	575	7430	67	60	35,143
42	649	645	8160	67	61	36,000
43	713	715	8867	68	61	36,857
44 45	776 850	783 860	9533 30188	67 67	65	87 714 88,571
		!	1		63	39.429
46 47	915 979	917 980	0833 1469	68 67	1 63	40 286
48	.3041	3046	2100	65	64	41.143
49	098	113	2750	64	64	42.000
50	155	170	3400	63	65	42.857
51	215	228	4031	62	65	43 714
52	268	287	4662	63	66	44.571
58 54	3:50	346	5281	61	66 67	45,429 46 286
D4	3×5 439	408	5900 6491	58 55	67	47.143

Nitric Acid-Continued.

er cent. HNO3	According to Ure at 15° C.	According to Kolb at 15° C.	According to Kolb at 0° C.	Differ- ences.	Expansion apparent for 1° F.	Per cent. o Na O5
56	.8492	.8517	.87082	55	.00068	48,000
57	546	578	7636	55	68	48.857
EG		630		35	69	49.714
58 59	600		8182	53 53	69	60.571
29 60	654 705	686 743	8750 9833	53 53	70	51.429
	100	190	8000	1,53		01.400
61	761	800	9917	52	70	52,266
62	814	855	.40500	52	71	53 143
63	808	905	1083	51	72	54,000
64	920	955	1573	50	72	54,857
65	975	.4003	2040	50	73	55.714
66	.4019	050	9507	49	74	56,571
67	065	096	2507 3000	49	74	67.420
68	115	148	8500	49	75	58.286
œ .	158	188	4000	47	28	59.143
70	200	232	4437	43	78 77	60,000
~						en 0=#
71	243	275	4874	41	78 80	60,857
21	286	310	5812	40	80	61.714
78 74	33 0	850	5728	38	81	62.571
74	373	388	6138	36	82	63.429
75	413	421	6547	35	84	64.286
76	451	456	6958	36	85	65,143
77		491	7329	35	86	66,000
78		526	7695	35	87	66.857
79		561	.8060	34	88	67,714
80		596	8427	34	99	68.571
81		680	5798	34	90	69,429
82				34	91	70.286
83	· · · · · · · · · · · · · · · · · · ·	665	9170		92	71.143
84		700	9542	84	93	72.000
85		796 778	9914 .50292	34 34	963 94	72.857
-	****************	110	.50.000	04		
86		810	0677	34	95	73.714
87	··· ··· · · · · · · · · · · · · · · ·	845	1062	84	96	74.571
88		876	1447	34	97	75,429
99	· · · · · · · · · · · · · · · · · · ·	907	1829	34	98	76.286
90		937	2210	35	99	77.148
91		968	2580	35	99	78.000
92		908	2929	35	100 °	78.857
92 93 94		-5039	8320	36	100	79,714
94		060	3700	36	101	80.571
95		120	4100	36	102	81.429
96		160	4448	36	103	82,286
97	···· · · · · · · · · · · · · · · · · ·	160		36	104	83.143
96	•••••	200	4796			
ED	· · · · · · · · · · · · · · · · · · ·	240	5164	3 6	105	84.000
99 100	••••••	270	5582	38	106	84.857
200		300	5900	38	107	85.714

ALCOHOL TABLES COMPARED.

Standard Temperature 60 · F. (15.6 · C.) Water at same Temperature-1.0000.

Per Cent.							i	
by						D		Differ-
Weight	Fownes.	Differ-	Gay-	Differ-	Tralles.	Differ- ences.	Stampfer.	ences.
of Absolute		ences.	Luerac.	ence		ences.		CHCC F.
Alcohol		•				١.	ì	
							·	
51	.9160	24	.9165	22	.91605	223	.91620	224
55	.9135	25	.9143	23	.91383	222	.91400	220
53	.9113	22	.9120	22	.91163	220	.91177	223
54	.9090	23	.9098	22	.90943	220	.90959	218
55	.9069	21	.9075	23	.90719	224	.90732	227
		i i		23	.90491	228	.90507	225
56	.9047	22 23	.9052	22	.90267	224	.90281	223
57	.9025 .9001	23 24	.9030 .9008	22	.90037	230	.90054	230
58		22		23	.89806	231	89820	234
59	.8979		.8985	23	.89577	229	.89592	228
60•	.8956	23	.8962		1			1
61	.8932	24	.8939	23	.89348	229	.89362	230
62	.8908	24	.8916	23	.89116	232	.89130	232
63	.88 8 6	22	.8892	24	.88883	238	. 58897	283
64	.8863	23	.8868	24	.88650	233	.88663	284
65	.8840	23	.8844	24	.88418	232	.88429	234
66	J8816	24	.8821	23	.88186	- 232	.88197	232
67	.8793	23	.8797	24	.87949	237	.87961	236
	.8769	24	.8773	24	.87714	235	.87727	234
68		24	.8750	23	.87479	235	.87491	236
69	.8745 .8721	24	.8726	24	.87240	239	.87251	240
70			-			ĺ		
71	8 69 6	25	.8702	24	.87001	239	.87013	238
72	.8672	24	.8678	24	.86764	237	.86775	238
73	.8649	23	.8655	23	.86527	237	. 86539	236
74	. 8625	24	.8631	24	.86289	238	.86303	236
75	.8603	22	.8607	24	.86050	239	.86062	241
76	8581	22	.8583	24	.85811	239	.85820	242
77	.8557	24	.8559	24	.85572	239	.85573	247
78	.8533	24	.8534	25	.85331	241	.85331	242
79	.8508	25	.8510	24	.85087	244	.85086	245
ยัง	.8483	25	.8485	25	.84840	247	.84839	247
• 1		1	1. 1.			1		1
81	8459	24	.8461.	24	.84591	249	.84592	247
82	.8434	25	.8436	25	.84347	244	.84350	242
83	.8408	26	.8412	24	.84098	249	.84101	249
84	.8382	26	.8387	25	.83847	251	.83850	251
85	8357	\5	.8361	25	.83559	258	.83592	258
86	.8331	26	.8335	26	. 83329	260	.83334	258
7	.8305	26	.8309	26	83074	255	.83080	254
88	.8279	26	.8283	26	82816	258	.82825	255
80	8254	25	.8257	26	82554	262	.82567	258
90	8228	26	8231	26	.82294	260	.82306	261
				1	.820:0	264	.82041	265
91	.8199	29	.8204	27				270
93	.8172	27	.8177	27	.81764	266 271	.81771 .81495	276
93	.8145	27	.8149	28	.81493		.81225	270
94	8118	27	8121	28	.81218	275 282	.80948	277
95	,8089	29	.8092	29	.80936	1		•
96	.8061	28	.8063	29	.80652	284	.80661	287
97	.8031	30	.8034	29	80362	290	.80361	800
98	8001	30	.8004	30	.80067	295	.80073	288
99	.7969	31	.7974	30	. 79765	302	.79773	300
100	.7938	81	7943	31	.79460	305	.79470	303
I				I	L		<u>'</u>	

ALCOHOL TABLES COMPARED.

Standard Temperature 60 F. (15.6 C.) Water at same Temperature—1.0000.

Squibb.	Differ- ences,	Gilpir.	Observed.	Differ- ences.	Gilpin, Fownes, Squibb, Lyons, Averaged.	Differ- ences.	Per Cent. by Weight of Absolute Alcohol.
586	221		.91616	222	587	223	51
. 91365	223	.91364	.91393	223	363	224	52
141	224		.91170	223	189	224	53
0916 6 91	225 225		.90946 .90722	224 224	0914 689	225 225	54 55
			}			1	
.90465	226	.90462	.90497	225	463	226	56
240 014	225 226		.90272	225 226	237 010	226 227	57 58
9788	226	.89781	.89819	220	.89783	228	59
.89561	227	.00101	89591	228	553	229	60
334	227		.89362	229	323	230	61
105	229		.89132	230	092	231	62
8872	233		.88901	231	8860	232	63
.88636	236	.88628	.88669	232	626	234	64
395	241		.88436	233	391	235	65
152	243		.88202	234	153	238	66
7907	245		.87967	235	7914	239	67
87665	242	.87677	.87731	236	674	240	68
426	239		.87493	238	433	241	69
188	238	· • • • •	.87254	:39	191	242	70
6950	238		.87014	240	6950	241	71
.86711	239		.86773	241	719	241	72
472	239	******	.86531	242	478	241	73
232	240	. 86246	.86288	243	237	241	74
5991	241		.86044	244	5996	241	.75
.85749	242	05504	85799	245	755	241	76
508	241	.85524	.85553	246	514	241	77
266 023	242 243		.85306	247 248	272	242 245	78 79
.84779	243		.85058 .84809	249	027 4781	245 246	80
l	1	04540	l		_	1	
529 278	250 251	.84543	.84559 .84308	250 251	533 284	248 249	81 82
027	251		84056	252	032	253	83
.83775	252		.83804	252	3779	253	84
523	252	.83534	.83551	253	525	254	85
270	253		.83296	255	270	255	86
015	255		.830:59	257	014	256	87
.82755	260		,82780	259	2754	260	88
491	264		.82519	261	491	263	89
224	267		.82256	263	225	266	90
1955	269		.81990	266	1956	269	91
.81684	271		.81721	269	654	272	92
410	274	,	.81448	273	410	276	93
181	279		.81171	277	131	279	94
0847	284	• • • • • •	.80890	281	0847	284	95
.80558	289		.80602	288	558	289	96
264	294		.80308	294	264	294	97
. 79967 . 79669	297		.80007	301	79965	299	98
4200000	298			308	660	305	99

Corrected Alcoholometrical Table.

		WEIG	er Per (ent.			Volume I	PER CENT	
3	Density in vacuo Temp. 60° F.	Specific gravity in air at 60° F.	Specific gravity in air at 60° F.	Specific gravity in air at 59° F.	Specific gravity in air at 59° F.	Specific gravity in air at 60° F.	Specific gravity in air at 60° F.	Specific gravity in air at 59° F.	Specific gravity in air at 59° F.
	Water at	Water at	Water at	Water at					Water a
10.1	60° F. =	60° F=	39° F. =	59° F.⇒	39° F =	60° F.=	89º F.=	59° F.=	39° F.=
•	1.000.	1.000.	1.000.	1.000,	1.000.	1.000.	1.000.	1.000.	1.000.
0	1.00000	1 0,3000	.99907	1.00000	.99915	1.00000 .99852	.99907	1.00000	.99915
2	99814 631	.99814 634	.99731 541	.99615 636	.99780 551	708	.99759 615	.99853 710	99768 625
3	460	460	307	463	878	566	473	568	483
4	291	291	198	295	210	427	834	429	344
5	128	127	034	182	-047	292	199	295	210
6	.98970	.98969	.98976	.98974	.98889	160	067	163	078
8	81.7 609	516 668	724 576	822 674	788 590	.98905	.98938 813	.98910	. 98950 825
9	523	545	433	532	448	387	690	.863	ලක 703
U	855	387	5.42	394	810	602	570	667	583
1	255	254	162	262	178	545	453	650	466
3	128 004	1¥7 003	.97911	1 36 013	.97929	431 319	839 227	437 325	853 241
4	.97841	.97842	791	97892	808	214	122	221	137
5	103	761	670	772	689	îii	019	118	034
6	641	639	548 426	652	569	009	.97917	017	.97933
8	519 3 18	517 396	920 305	581 411	448 328	.97909 808	817 717	.97917 818	833 734
ğ	ນີ້ເປັ	274	183	290	207	708	617	719	635
י	153	151	060	169	086	607	516	618	535
1 2	.96901	026 .96898	.96935 807	045 .96918	.96962	506	415	517	434
3	771	768	677	789	835 706	405 303	814 212	417 816	344 233
4	634	635	544	657	574	201	110	215	182
5	502	490	409	522	440	097	006	112	0.29
6	363 220	359 216	269 126	383 241	301 159	.96992 884	.96901 793	.96801	.96924 818
8	073	069	.95979	095	018	773	682	791	708
)	.95923	.95918	838	.95944	.95862	660	569	679	596
0	วิชช	761	6.1	788	706	545	455	565	483
1	604 . 4:36	599 431	509 311	627 460	545 378	428 308	338 218	449 330	367 248
3	264	259	169	288	206	185	095	209	127
	087	043	.94993	112	031	057	.95967	081	95999
5	.91907	.94901	813	.94932	.94851	.95925	835	.95949	867
6	700 533	516 527	G27 439	747 558	666 477	788 616	698 556	813 672	731 590
اغ	339	313	214	365	284	500	410	526	444
9	142	.136	017	168	087	351	261	377	296
0	.93943	.93936	.93848	.93969	.93889	198	108	224	143
1	741 536	734 528	646	707	087 483	041	.94952	069	.949 98 8 26
š	839	833	410 231	563 356	473 276	.94879 711	790 622	.94907 739	658
4	119	112	021	146	067	540	451	569	488
5	.92909	.92901	.92814	.92936	.92857	363	274	892	311
Ç.	695	687	600 384	722	643	183	094 .93912	211	131 .93949
ŝ	479 261	471 253	166	507 289	428 210	.93814	.93912 726	.93843	763
9	042	033	.91946	070	.91991	625	537	653	573
0	.91820	.91811	7:23	.91848	769	433	345	463	883

Corrected Alcoholometrical Table—Continued.

	i	WEI	энт Ркв (CENT.		1	Volume 1	PER CENT.	
#	Density in vacuo Temp. 60° F.	Specific gravity in air at 60° F.	Specific gravity in air at 60° F.	Specific gravity in air at 50° F.	Specific gravity in air at 50° F.	Specific gravity in air at 60° F.	Specific gravity in air at 60° F.	Specific gravity in air at 59° F.	Specific gravity in air a 50° F.
cent.	Water at				Water at		Water at		
ĭ	60° F	60° F'. =	39° F.=	50° F. =	39° F =	60° F. =	89° F. =	50° F.=	39° F
į	1.000.	1.000,	1.000.	1.000.	1.000,	1.000.	1.000.	1.000.	1.000.
51	.91588	.91589	.91503	.91625	.91547	.09288	.93150	.93268	.93188
 	375	366 141	280 055	408 178	825 100	.92837	.92951 750	92868	.92090 219
7	.90926	90016	.90831	.90954	.90876	632	545	664	565
ပ်	701	691	606	729	651	423	545 838	455	876
i)	476	463	880	508	425	212	125	245	166
5	251	240	155	278	201	.91998	.91912	032	.91938
5R 10	026 .H9H01	015 . 6973 0	.89930	.89829	.89976	780	694	.91814 593	785
ũ	574	563	706 479	602	752 525	560 837	474 251	370	515 293
81	347	335	251	373	208	118	027	146	930
€2 63	116	104	050	144	063	.90887	.90802	.90921	.90843
H	.86883 648	.88871 648	.88788 553	,88011 676	.88835 600	660 430	575 345	695 454	617 887
ŝ	4.9	397	314	437	361	199	114	223	156
56	169	156	073	197	121	.89967	.89883	002	.89926
57 64 .	.87929 684	.87916	.87831 589	.87956 711	.87881 636	733 497	649 414	.89769 534	692 457
50	438	671 425	343	465	390	257	174	298	217
Ö	197	184	102	224	149	012	88929	049	.88978
7	.86959	.86945	.86864	.86085	.86911	.88760 500	677	.88797	721 46 1
3	723 444	708 4.0	627 389	748 510	674 436	235	417 152	537 271	196
í	244	230	149	2.0	196	.87968	.87896	ño5	87930
3	004	,85989	.85909	030	.85957	700	618	.87737	663
6	.86763 521	748 506	668 446	.85780 547	716 474	431 161	349 079	468 198	894 124
÷ 1	279	261	184	305	23:	.86890	.86809	.86027	.86854
2	036	021	.84911	062	.84969	618	537	656	583
٧)	.84793	.84777	698	.84819	746	344	263	382	809
11	543 202	527 276	448 197	568 317	496 245	.85784	.85085 104	105 .85823	.85751
3	041	025	.83946	066	.83994	498	418	537	465
4	.83791	.83774	696	.83816	741	208	128	247	175
5 5	530	5:53	444	568	492	,84913	.84834	.84953	.84881
6	286	269	191 .82935	310	.829K3	613 305	534	653	582
	030 17728.	013 82753	6.6	.82895	.800FG	.83991	.83912	845 031	.83960
o i	508	490	413	582	461	673	594	.83713	642
(A)	212	224	147	265	195	348	270	888	318
91 92	.81973	.81955	.81878	.81906	.81926	018 .82678	.82940	058 .82719	.8:2988
33	702 427	6⋅3 40⊀	606 33.2	725 450	655 380	332	6 ·1 (21)	362	649 292
91	148	129	053	171 '	101	.81951	.818.1	.81990	.81921
6	,80864	.80815	.80765	.80856	.80817	568	492	609	540
96 97	575	556 263	487 148	597 305	528 236	171 .80755	.80678	211 .80793	142 .80725
94 94	283 .79967	.79967	.70.97	008	.79940	816	2.8	353	.80723 285
90	697	667	502	.79708	640	.79857	.79773	887	.79830
00	370	350	2,5	300	323	350	275	389	822

Comparison of Alcohol Tables.

Standard temperature, 60° F. (15.6° C.); water at same temperature—1.0000.

er cent. by volume of absolute Alcohol.	Hehner.		Gay Lussac.		Trailes.		Stampfer.		Obscrved.	_
1	.99849	151	.9985	15	.9985	15	.9985	15	,99R50	1
2 8	.99715	134	.9970	15	.9970	15	.9970	15	.99706	1
8	.99580	135	.9956	14	.9956	11	30th.	14	,99565	!
4 5	.99437 .99800	143	.9042 .9929	14 18	.9942 .9928	11	.9942 8500.	14 14	99127	1
6	.99173	127	.9916	18	.9915	13	.9115	13	.99160	1
7	.99041	132	.9903	13	.9902	13	9902	1.3	.99031	់ រ
8 ;	.96921	120	.9891	12	.9890	12	.9890	12	.98006	, 1
9 10	.98905 .986 84	116 121	.9878 .9867	13	.9878 .9866	12 12	.9878 .9867	12	.98783 .98633	1
11	.98570	111	,9855	12	.9854	12	.9855	12	.98546	1
12	.98456	114	.9843	12	.9843	11	.9844	11	.98432	1
13	.98346	90	.9832	11	.9832	11	.9833	11	.98320	1
14	.98239	107	.9821	111	.9821	11	.9622	11	.98215	6
15	.98132	10%	.9811	10	.9811	10	9811	11	.98112	I
16 17	.9802 6 .97918	106	.9801	10 10	.9800	11 10	.9800	41 10	.98010 .97910	1
18	.97823	95	.9791 .9781	10	.9790 .9780	10	.9790 .9780	10	.97810	li
19	97738	95	.9772	1 20	.9770	10	.9770	io	.97710	li
20	97626	102	.9762	10	.9760	10	.9760	iö	.97609	i
21	.97519	107	.9752	10	.9750	10	.9750	10	.97508	1
22	.97419	100	9742	10	.9740	10	.97 40	10	.97407	1
23	.97311	108	.9732	10	.9729	11	.9730	10	.97304	1
24 25	.97208 .97108	108 100	.9720 .9710	12	.9719 .9709	10	.9720 .9710	10 10	.97201 .97008	1
26	.97004	104	.9699	111	.9698	11	.9699	11	.96993	١,
27	96894	110	CRINE.	10	9688	10	.9089	10	.96885	1
28	186784	110	.9018	11	!4677	11	.9678	11	.96775	1
29 30	.96674	110	.9667	111	,9666	11	.(MMS7	11	.96663	1
	.96564	110	9656	11	.9655	11	.9656	11	.96548	
81 32	.96448 96324	116 124	.9644 2639,	12	964 3 .9631	12 12	.9614 .9632	12 12	.96431 .96310	1
33	.96198	126	.9620	liž l	.9618	13	.9618	iš l	,96186	i
34	.98076	122	.9607	iã	.9605	13	9605	13	96059	l i
35	.95:137	139	.9593	14	.95.92	13	.9593	12	.95928	1
36	.95806	131	.95;9	14	.9579	13	.9580	13	.95793	1.
37 38	.9565 3 .955 06	153	.9565	14	9565	111	.9566 .9551	14 15	.95652 .95506	1
. 39	.95365	147	.9550 .9535	15 15	9550 .95 3 5	15 15	.9536	15	.95357	i
40	95221	114	.9521	14	9519	16	,9520	16	.95204	1
41	,95062	161	9505	16	.9503	16	,9504	16	.95046	1:
43	.94878	188	.9489	16	.9487	16	.9188	16	.94883	16
13	94693	180	.9172	15	.91.0	17	.9471	17	.94717	16
44 45	.94530 .943 67	162 163	,9455 ,9 43 8	17	.913 3 .9135	18	91 4 .9436	17 18	.94547 .9437 8	17
nį.	.91903	164	.9120	18	.9417	18	.9418	18	.94196	17
17	91034	179	.9101	15	9399	is	9100	18	94015	15
151	93838	186	9383	18	9381	is	9389	14	.93831	15
49 '	.93654	184	.9364	19	.9362	17	9363	19	.93644	15
50	.93162	192	.9315	19	.9313	19	.9315	18	.93453	15
51	.03264	198	9326	19	.93:28	30	.9325	20	.98259 93062	15
52	93062	202	930 6 928 6	20	930 3 928 3	20 2)	.9305 .9385	20	.92860	19 20
34	ي: ا⊶ت.ا:.	210	11.270	250	3737-0	1 4 1	.37.70	. 17	92675	20

Comparison of Alcohol Tables—Continued.

										_
Per cent, by volume of absolute Alcohol.	Hehner.		Gay Lussac.		Tralles.		Stampfer.		Observed.	
55	.92428	212	.9245	21	.9242	20	.9244	20	.92447	208
56	.92214	214	.9224	21	.9221	21	9223	21	,92235	212
57	.91995	219	.6203	21	.9200	21	SH.6.	21	,920:21	214
58	.91783	212	.9182	21	.9178	2:	.91>0	22	.91863	218
59	.91553	230	.9160	32	.9156	23	9158	23	.91542	221
60	.91315	238	.9138	22	.9181	124	.9186	22	.91859	223
61	.91094	221	.9116	22	.9112	22	.9114	22	.91135	224
62	.90866	228	.9098	23	.9090	23	5002	22	90010	:25
63	90654	212	.9070	23	.9067	21	GRUIL	23	90644	226
64	.90480	221	.9017	23	.9044	21	.9046	23	90456	224
63	.90203	22	.9024	23	.9021	13	.9028	24	.90235	231
u.,	.90206	1 ***	.5002	~		1		ł		1
66	.89958	245	.9001	23	.8997	21	,8998	24	.80092	233
67	.897:28	230	8977	21	.8973	21	.89.4	51	.HU:57	235
68	.89483	245	.8953	134	.8949	21	,8950	24	.80517	240
69	.89:228	255	.89:29	21	.49:25	21	8£934,	21	.89274	. 43
70	£8088,	246	.8904	25	.6009	25	.1901	25	.89029	-45
71	.88743	239	.8878	26	.8875	25	.8976	25	.88789	247
45	.88495	218	.8853	25	8850	25	.8851	25	.88532	250
13	.88238	257	.8827	26	.8825	25	.8826	25	.88278	254
รัง	.87982	256	.8801	26	8790	26	.8800	26	.88022	256
75	.87722	200	.8775	26	8,78	26	8774	20	.87762	262
					1		20.00		U=400	
76	87453	269	.8749	26	.8747	26	.8748	26	.87497	265
77	.87183	270	.8723	26	.8720	27	.8721	27	.87:259	268
78	.86000	283	.8695	28	.8698	27	.8694	27	.86056	278
79	.86630	270	.8668	27	.8666	27	.8667	27	.80680	
80	.86363	207	.8641	27	.8639	27	.8640	27	.86401	279
81	.86100	263	.8613	28	.9611	28	.8612	28	.86122	279
X2	.85850	250	.8585	28	.8583	28	.8544	28	.85840	282
83	.85570	280	8556	29	.8555	28	.8:.55	29	.85553	287
84	.85283	287	.8527	29	,8526	20	.87.26	23)	.85261	202
85	.84990	803	.8498	29	.8496	80	.8496	30	.84958	303
86	.84683	297	.8468	30	.8166	80	.8466	30	.84654	304
87	.84378	305	.8438	30	.8436	30	.8136	30	.84346	308
88	.84050	328	.8407	31	.8405	31	8405	31	.84029	317
89	.83723	327	.8375	32	.8373	32	.8373	1 32	23703	321
90	.83398	3525	.8342	33	.8339	34	.8340	33	.83383	326
•	88058		.8308	34	.8306	33	.8307	33	,83046	336
91 92	82718	340 340	.8274	34	8272	184	8273	34	82704	342
				36	8237	35	8238	35	82359	346
98 94	.82380 .82000	338	.8238 .8202	36	.8201	36	8:02	36	81991	307
95	.81610	390	.8164	38	.8164	37	.8165	37	.81612	379
						i ·			01017	395
96	.81330	380	.8124	40	.8125	39	.8126	39	,81217 ,80806	411
97	.80810	420	8082	42	.8084	41	.80%5	41	80379	427
98	.80373	437	8038	41	.8041	43	.8043	43	.79897	482
99	79890	483	7902	46	.7995	46	.7996	49	79388	514
100	.79880	510	.7943	49	.7946	49	.7947	49	.78000	214
		1					1	<u> </u>	<u> </u>	

Relation of Volume to Weight Per Cent. of Alcohol.

Per Cent. (Vol.) Abso- lute Al- cohol.	Per Cent. by Volume Corresponding to Per Cent. by Weight.	Per Cent, (Vol.) Abso- lute Al- cohol.	Per Cent. by Volume Corresponding to Per Cent. by Weight.	Per Ceut. (Vol.) Absolute Alcohol.	Per Cent. by Volume Corresponding to Per Cent. by Weight.	Per Cent. (Vol.) Absolute Alcohol.	Per Cent. by Volume Co responding to Per Cent. by Weight.	Per Cent. (Vol.) Absolute Alcohol.	Par Cent, hy Volume Corresponding to Per Cent, by Weight.
1	1.258	21	25,672	41	48,426	61	68.670	81	86, 283
2	2.511	22	26 859	42	49.499	62	69.616	82	87.089
2 3	3.760	23	28.043	43	50.566	63	70.555	83	87.8-9
4	5.004	54	29.223	14	51.626	64	71.482	84	88.683
5	6.245	25	30.398	45	53.679	65	72.401	85	89.469
6	7.482	26	31 568	46	53,725	66	73.312	86	90.247
7	8.716	27	32.734	47	54.765	67	74.219	87	91.016
8	9.947	28	33.894	48	55.799	68	75.122	88	91.775
9	11.173	29	35.050	49	56.826	69	76.017	89	92 523
10	12.397	30	36.199	50	57.846	70	76.906	90	93 261
11	13.619	31	37,843	51	58.861	71	77.793	91	93.989
12	14.838	32	38,480	52	59,868	73	78.678	92	94 707
13	16 054	33	39.610	53	60.869	73	79.547	1 93	95 415
14	17.267	34	40.734	54	61.86	74	80 413	94	96 110
15	18.477	35	41.853	55	62. 55	75	81.272	95	96 793
16	19.685	36	42.965	56	63.838	76	82.125	96	97.462
17	20 888	37	44 0:0	57	64 815	77	82.971	97	98.120
18	22 090	38	45 168	58	65, 789	78	83.811	98	98.767
19	23.288	39	46 261	59	66 756	79	84 648	99	99 400
20	24.482	40	47.347	60.	67.717	80	85.470	100	100,000

HYDROCHLORIC ACID.

	According to Ure, at 59° F.	According to Kolb, at 59° F.	Observed Sp. Grav. at 59° F. Water at 59° F.—1,000	Differences.	Observed Sp. Grav. at 59° F. Water at 39° F.—1,000.	Density in Vacuo, at 59° F. Water at 29° F.—1.000.	Expansion (Apparent for 1° F.
0	1.00000	1.0000	1.00000		.99915	.99915	
1	1.00490	1.0050	1.00496	496	1.00411	1.00411	.00008
2	0981	100	0992	496	0907	0906	.00008
3	1472	150	1486	494	1400	1399	.00009
4	1962	200	1979	493	1893	1891	.00010
5	2443	252	2472	493	2385	2383	.00010
6	2926	804	2965	493	2878	2875	.00011
7	3333	851	8457	492	3369	3366	.09012
8	3824	400	3949	492	8861	3857	.00013
9	4314	450	4442	493	4853	4349	.00014
10	4805	504	4936	494	4847	4842	.00015
11	5295	5 55	5482	496	5343	5338	.00016
12	5800	605	5981	499	5841	5835	.00017
13	6276	655	6431	500	6341	633 5	.00018
14	6767	705	6931	500	6840	6833	.00019
15	7257	755	7431	500	7840	7333	.00020
16 .	7748	808	7933	502	7842	7884	.00021
17	8238	860	8437	504	8845	8337	.00022
18	8727	910	8944	507	8852	8863	.00028
19	9219	960	9453	509	9360	9350	.00024
20	9810	.1010	9963	510	9870	9860	.00025
21	.10306	061	.10474	511	1.0380	1.0369	.00027
22	0810	111	0986	212	0892	0881	.00028
23	1311	161	1499	518	1405	1393	.00029
24	1820	214	2014	515	1919	1908	.00030
25	2325	264	2531	517	2436	2423	.00031
26	2822	312	3052	521	2956	2943	.00032
27	3325	366	3577	525	34 81	3467	.00033
28	3823	416	4103	526	4006	3991	.00034
29	4335	466	4628	525	4 531	4516	.00035
30	4852	516	5147	519	5050	5034	.00036
31	5375	566	5659	512	5561	5545	.00037
32	5880	616	6164	505	6066	6049	.00038
:33	6395	666	6668	504	6569	6552	.00039
34	6887	721	7170	502	7071	7053	.00040
35	7377	771	7568	498	7469	7451	.00040
36	7877	819	8162	494	8062	8043	.00041
37	8389	865	8654	492	8554	8535	.00041
3 8	8784	912	9145	491	9044	9024	.00042
39	9214	956	9535	490	9434	9414	.00043
40	9657	.2004	.20000	465	9899	9878	.00044
41	.20098	048	0445	445	.20343	.20322	.00045
42	1	093	0885	440	0783	0761	.00046
43	1	130					1

Nitric Acid.

Per cent. H N O ₃	According to Ure at 15° C.	According to Kolb at 15° C.	According to Kolb at 0° C,	Differ- ences.	Expansion apparent for 1° F.	Per cent. of N ₂ O ₅
0	1.0000	.9989 (1)	1.00000			,
1	1.0057	1 0.45	1.00636	57	,00000	.857
8	114	102	1273	57	10	1.714
8 ;	171	163	1983	58	11 12	2,571 8,429
4 5	230 288	220 284	2582 8250	57 58	14	4.286
6	342	843	3890	58	16	5.143
7	400	408	4585	59	18	6 000
ė i	458	468	5:300	60		6.857
ğ	515	520	5867	60	222	1 114
10	579	587	6560	60	24	6.571
11	639	647	7283	60	26	9.429
13	701	707	7900	61	20	10,286 11,143
13	761	708	8567 9229	61 62	31 . 3 3	12 (40)
14	825	830 892	9871	61	84	12.857
15	886				1	:
16	948	952	.10533	68	36	13.714
17	.1009	.1013	1200	65	88	14.571
18	076	060	1878	62	40 42	15.439 16.286
19 20	142 203	137 199	2560 3262	•63 63	44	17.143
21	268	263	4067	63	46	18 000
22	331	327	4578	64	48	18 857
23	347	891	5269	64	49	19.714
24	451	458	5962	64	50	20.521
25	525	526	6633	65	50	21.429
26	589	591	7308	65	51	22 286
27	653	657	8000	66	52	23,143
28	117	723	8667	66	52	81.000
29 30	781 846	787 853	9346	66	58 54	24.157 25,714
		920	1	65	: 55	26 571
31 32	914 9 8 6	980	0731 1388	(36	56	27.429
33	2055	2048	2036	66	1 56	23,286
31	123	113	2700	66	57	29.143
35	190	178	8375	66	58	80 000
36	261	243	4063	65	58	30,857
3.	327	810	4733	66	59	3114
:15	390	378	5393	66	59	32.571
39 40	455 519	445 508	6086 6730	67 66	59 60	33,429 84,23 6
	588	575	7430	67	60	35.143
41	649	. 645	8160	67	61	36,(N)
43	713	715	8867	GH	Ği	36 857
41	776	783	9533	67	6.3	87 714
45	850	850	. 50188	67	65	84.571
46	915	917	. 0933	68	63	39,429
47	979	980	1469	67	63	40 250
48	.3041	.8046	2100	65	' 64	41.143 42,000
49 50	098 155	113 170	2750 3400	64 68	64 65	42,857
51		228	4081	62	63	43 714
52	215 208	287	4051	62	66	44.571
53	3.75	346	5281	61	66	43,429
54	355	408	5900	58	67	46 296
55	439	460	6491	55	67	47,143

Nitric Acid—Continued.

Per cent. HNO ₃	According to Ure at 15° C.	According to Kolb at 15° C.	According to Kolb at 0° C.	Differences.	Expansion apparent for 1° F.	Per cent. o Nº O5
56	.3492	.8517	.87082	55	.00068	48,000
57	546	578	7636	55	. 68	48.857
58	600	680	8182	55	69	49.714
59	654	686	8750	53	69	50.571
60	705	748	9833	53	70	61.429
61	761	800	9917	52	70	52,286
62	814	855	.40500	52	71	53 143
63	808	905	10H3	51	72	54,000
64	9:20	955	1573	50	72	54,857
65	975	.4003	2040	50	73	55.714
66	.4019	050	2507	49	74	56 ,571
67	065	096	8000	40	74	57.429
68	115	148	8500	49	75	58.286
69	158	188	4000	47	76	59,143
70	200	233	4437	43	77	60.000
71	243	275	4874	41	78	60,857
72	286	310	5312	40	80	61.714
73	330	850	5728	38	81	62.571
74	373	38 8	6188	36	82	63,429
75	413	421	6547	35	84	64.286
78 77 78	451	456	6958	36	85	65.143
77		491	7329	35	86	66,000
78		526	7695	35	87	66.857
79		561	.8060	34	88	67.714
80		596	8427	31	99	68.571
81		630	8798	34	90	69,429
82		665	9170	84	91	70.246
83		700	9542	34	92	71.143
84	. 	736	9014	34	93	72.000
85		778	.50292	34	94	72.857
86	 	810	0677	34	95	73.714
87		845	1062	84	96	74.571
88		876	1447	31	97	75.429
89 90	. 	907	1829	34	98	76.286
90 i	· · · · · · · · · · · · · · · · · · ·	937	2210	35	99	77.148
91		968	2580	35	99	78.000
92		998	2920	35	100	78,857
93	 	.5039	8320	36	100	79,714
94		0⊌0	3700	:36	101	80,571
95		120	4100	36	102	81.429
96		160	4448	36	103	82,286
97		200	4796	36	104	83,143
98		240	5164	36	105	84,000
99	******	270	5582	38	106	84.857
100		300	5900	38	107	85,714

Sulphuric Acid.

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Per cent. L. 804	According to Otto at 15° C.	According to Kolb at 13° C.	Observed at 15° C. Water at 15° C.— 1.000.	Observed at 15°C. Water at 4° C.== 1.000.	Density in vacuum at 15° C. Water at 4° C. =1.000.	Per cent. of SO ₃	Apparent expansion for 1° Fahr.
0 1 2 3 4 5	1.0000 1.0064 180 190 256 320	.9944(?) 1.0008 078 156 234 806	1.0000 1.0066 189 198 265 838	.9992 1.0057 123 189 256 394	.9992 1,0057 128 189 256 824	.816 1.633 2.449 3.965 4.062	.00008 09 10 12 14
6 7 8 9 10	390 464 536 610 680	396 464 536 614 696	408 471 641 611 682	393 462 583 602 673	898 462 581 601 672	4.808 5.814 6 581 7.847 8.163	15 17 18 19 20
11 13 14 15	7% 830 910 980 .1080	765 837 910 990 1065	758 825 897 970 .1048	744 816 888 961 .1084	748 815 867 960 .1088	8.980 9.796 10 612 11.429 12.245	21 22 23 24 25
16 17 18 19 20	196 210 290 360 440	144 226 302 876 458	117 191 265 840 415	107 181 255 880 408	106 180 254 829 404	18.061 18.878 14.694 15.510 16.826	26 27 28 28 28 29
21 23 23 24 25	516 590 670 740 820	688 608 696 702 840	491 567 644 722 801	481 557 684 712 791	480 555 682 710 789	17.148 17.959 18.775 19.592 20.408	30 31 32 33 33
89 81 82 82 88	900 980 ,2066 150 230	919 998 ,9070 150 230	980 959 ,9088 118 198	870 949 .9028 108 188	968 947 .9026 106 186	21.824 22.041 22.857 23.673 24.490	34 34 35 35 35 35
31 8: 83 81 35	810 890 476 560 640	810 898 488 573 656	979 861 443 526 609	269 350 432 515 596	967 848 490 512 615	25.306 26.122 26.939 27.755 28.571	35 35 36 36 36
86 87 89 80 40	790 810 890 976 8060	819 900 986 .3064	693 777 862 947 ,3088	766 851 936 3022	679 763 848 733 .8019	29.388 30.204 31.020 31.836 32.653	36 36 36 36 36
41 43 44 44 45	940 830 420 510	285 820 413 515	207 295 384 474 565	196 284 373 463	100 193 281 870 460	34.285 34.285 35.109 35.918 36.834 37.551	36 37 37 87 87
47 48 49 50	700 790 896 980	710 802 900 990	658 758 849 946	646 741 887 984	649 737 833 930	88.367 89.184 40.000 40.817 41.638	87 87 37 38 38
5 <u>8</u> 58	180 280	180 280	143 243	131 231	127 227	42.450 48.266	39 40

Sulphuric Acid-Continued.

			P				
Per cent. Ha 804	According to Otto at 15° C.	According to Kolb at 15° C.	Observed at 15° C. Water at 15° C.= 1.000,	Observed at 15° C. Water at 4° C.= 1.000.	Density in vacuum at 15° C. Water at 4° C. ==1.000.	Per cent. of SO ₃	Apparent expansion for 1° Fahr.
54	.4380	.4380	.4348	.1881	.4397	44.088	.00040
55	480	487	444	482	438	44.890	41
56	586	590	546	584	599	45.715	43
57	690	600	649	687	638	46.581	48
58	800	800	758	740	785	47.847	44
59	900	918	858	845	840	48.164	45
60	.5010	.5026	964	951	946	48.980	46
61 63 64 65	190 230 840 450 570	1740 2446 253 460 573	.5070 177 285 894 504	.5057 164 272 881 491	.5059 159 267 876 486	49.796 50.613 51.429 52.345 58.068	47 48 49 51 68
66 67 68 69 70	680 800 980 .6040	686 800 916 .6088 615	615 727 839 952 .6064	602 714 825 988 .6050	596 708 819 988 .6044	58 878 54.094 55.511 56.827 57.148	55 56 60 61 61
71	270	270	176	162	164	57.960	61
72	300	385	288	274	968	58.776	62
78	510	497	399	385	879	59.599	63
74	680	621	511	497	490	60.409	62
75	750	745	623	609	608	61.385	62
76 77 78 79	800 980 .7100 220 840	. 868 980 .7098 915 811	784 846 957 ,7068 179	720 839 948 .7054 164	718 825 936 .7047 157	62.041 62.857 63.674 64.490 65.806	61 61 60 59
81	450	450	290	275	968	66.123	58
82	560	556	400	885	378	66.930	58
83	670	644	509	494	487	67.865	58
84	770	782	615	600	592	68.573	57
85	860	894	718	706	695	69.388	56
86	940	915	818	808	795	70.904	55
87	.8620	.8000	918	000	892	71.021	54
88	090	080	8008	888	980	71.837	58
69	160	150	88	88(8.	, 8060	72.653	53
90	220	210	158	881	181	73.470	58
91	270	260	218	198	190	74.286	58
92	810	800	263	248	240	75.102	58
93	840	380	308	288	280	75.919	53
94	856	350	335	320	812	76.735	58
95	876	866	362	847	839	77.551	58
96 97 98 9634	884 400 406	360 392 403	384 835 405 420•	369 380 390 405	361 373 382 397	78.367 79.184 80.000	58 58 58
100	420	412	410	395	387	80.816	58
	426	420	390	875	367	81.683	58

Phosphoric Acid.

_								
Per ct. H3 PO.	According to Hoffmann at 15° C.	According to Schiff at 15° C.	Observed at 15° C. Water at 15°=1.000.	Observed at 15° C. Water at 4° C.—1.000.	Difference.	True density in vacuum at 15° C. Water at 4° C. = 1.000,	Per cent. P ₂ O ₅	Apparent ex- parsion for lo F.
0 1 2 8 4 5	231	1.0000 1.0054 109 184 220 276	1.00000 1.00565 1131 1698 2265 2833	.99915 1.00480 1046 1612 1179 2746	565 566 567 567 568	.99915 1.00479 1045 1610 1177 8748	.725 1.449 2.174 2.898 8.623	.00009 09 10 10
6 7 8 9 10	401 460 518	828 890 419 568 567	8405 8985 4572 5166 5768	8818 8497 4484 5077 5678	572 580 587 504 602	8815 8893 4470 5072 5672	4.847 5.072 5.796 6.521 7.245	11 12 12 12 12
11 12 18 14 15	645 703 761 830 888	627 688 749 . 811 874	6878 6081 7592 8206 8824	6283 6890 7501 8114 8732	605 608 611 614 618	6277 6883 7494 8106 8723	7,970 8,694 9,419 10,113 10,868	18 13 14 14 15
16 17 18 19 20	.1016 074 142	937 .1001 065 130 196	9451 .10094 0719 1359 2006	9358 9900 .10625 1264 1911	627 633 635 640 64 7	9849 9980 .10614 1253 1899	11.502 12.817 13.041 13.706 14.490	15 16 16 17 17
21 22 23 24 24 25	209 327 399 472 546	202 829 397 465 584	2660 3321 3189 4666 5852	2564 3525 8802 4568 5254	654 661 668 677 696	2551 8212 8878 4553 5239	15.215 15.939 16.664 17.388 18,113	18 18 19 19 20
26 27 28 29 30	682 755 817	604 674 745 817 889	6045 6740 7448 8164 8888	5946 6641 7348 8063 8787	692 695 708 716 724	5930 6624 7830 8045 8 768	18.837 19.562 20.286 21.011 21.735	20 20 21 21 21 22
81 82 83 84 85	110 182 265	962 ,2036 111 186 262	9618 .20354 1006 1844 2598	9516 .20251 0998 1740 2494	790 786 749 748 754	9496 20230 0971 1717 2470	22,460 23,184 23,969 24,633 25,858	22 23 23 23 24
86 87 89 89 40	408 485 563	838 415 493 572 651	8358 41:23 4893 5670 6454	8258 4017 4787 5563 6346	760 765 770 777 784	8229 8902 4761 5536 6819	26.082 26.807 27.531 28.256 28.960	24 25 25 26 26
41 42 48 44 45	796 869 951	781 812 894 976 8059	7245 8045 8454 9672 .80500	7197 7986 8744 9562 .80889	791 800 809 818 828	7109- 7907 8714 9581 .30357	29.704 80.429 81.158 81.878 82.602	27 27 28 28 28 28
46 47 46 49 50	192 270 346	143 227 813 399 486	1338 2186 3044 8012 4790	1226 2074 2031 3798 4675	838 848 858 868 878	1193 2041 2897 8763 4689	83.327 84.051 84.776 35.500 86.225	29 29 29 30 30
51 52		573 6 6 1	5678 6575	5568 6459	868 897	5526 6421	36.949 37.614	81 81

Phosphoric Acid—Continued.

Per ct. H, PO,	According to Hoffmann at 15° C.	According to Schiff. at 15° C.	Observed at 15° C. Water at 15°=1.000,	Observed at 15° C. Water at -i° C.=1.000.	Difference.	True density in vacuum at 15° C. Water at 4° C. = 1.000.	Per cent. Pa O ₅	Apparent ex- pansion for
53 54 55	.8687 775 868	.3750 840 931	.87481 8397 9322	.87854 8279 9204	906 916 925	.37325 6239 9163	38.398 39.123 39.847	.00032 82 82
56 57 53 59 63	953 4047 114 740 830	.4023 114 207 301 395	.40257 1202 2155 3120 4005	.40188 1082 2035 3000 8974	935 945 953 9.35 9.65	.40096 1039 1991 2955 3928	40,502 41,286 42,021 42,745 43,470	83 83 84 84 85
61 62 63 63 63	428 525 6.0 728 834		5077 6087 7064 8068 9080	4955 5944 6940 7942 8053	982 990 997 1004 1012	4908 5606 6891 7893 8902	44.194 44.919 45.643 46.368 47.092	35 35 36 36 36
388.38	931 .5 .5 151 268 377		.50100 1128 2164 3208 4200	9972 .51000 2035 3078 4129	1020 1028 1036 1044 1052	9920 50074 1981 9022 4073	47,817 48,541 49,266 49,990 50,714	87 37 38 38 38
1122115	481 60) 706 817 929		5319 6385 7459 8540 9630	5187 6252 7325 8406 9495	1059 1066 1074 1081 1090	51:20 61:02 7264 8344 9483	51,439 52,168 52,898 53,612 54,887	89 40 40 41 41
86233	991 6162 278 804 510		.60727 1932 3044 4164 5289	.60591 1795 2906 4025 5159	1097 1105 1112 1120 1125	60527 1730 2840 8957 5000	55.061 55.786 56.510 57.235 57.969	42 42 41 40 39
SEEE 3	627 742 860 976 .7091		6420 7558 8706 9860 .71020	6279 7416 8568 9716 .70675	1131 1138 1148 1154 1160	6209 7345 8491 9642 70600	58.684 59.408 60.133 60.857 61.582	39 38 38 38 38 38
88833							62,807 63,031 63,756 64,480 65,905	
91 92 93	809 931 .8051						65,929 66,654 67,878	

Potassa.

Per cent.	K H O U. S. P. 15° C.	KHO Geriach. 15° C.	K _s O Gerlach. 15° C.	K ₂ O Tunnermann. 15° C.	R ₂ O Duiton.
0 1 2 8 4 5	1.000 (?)	1.000 1.000 17 25 38 41	1.000 1.010 20 80 80 48	.9992 (?) 1.0068 188 276 873 478	1.064
6 7 8 9 10	1.077	49 58 65 74 88	56 66 78 80 99	869 667 789 878 979	1.1158
11 12 18 14 15	1 124	.101 11 19 28	.110 91 82 48 54	.1086 195 309 490 586	
16 17 18 19 20	1.175	87 46 55 66 77	66 78 90 .202 15	654 774 806 .9020 148	1.1750
21 22 23 24 25	1.280	88 98 . 209 20 30	80 42 56 70 85	977 408 548 680 818	1.8118
26 27 28 29 30	1.288	41 52 64 76 88	.300 12 26 40 55	962 .8108 .257	1.369
81 83 83 84 85	1.849	.800 11 24 86 49	70 85 .403 18 81		1.425
86 87 88 89 40	1.411	61 74 87 .400 11	45 60 75 90 .504		1.4748
41 42 43 44 45	1.475	285 288 50 623 74	22 89 54 70 84		1.5640
46 47 48 49 50	1.539	88 90 .511 97 89	.600 15 80 • 45 60		
51 52 58 54 55	1.604	52 65 78 90 .604	76 90 .705 20 88		

Potagea-Continued.

Per cent.	K H O U. S. P. 15° C.	KHO Gerlach. 15° C.	K. O Gerlach. 15° C.	K. O Tunnermann. 15° C.	K ₂ O Dalton.
56 57 58 59 60 65	1.067 1.729 1.790	,618 30 41 55 67	.746 69 90 95 .810		

Soda.

Per cent.	Na H O U. S. P. 15° C.	Na H O Gerlach. 15° C.	NasO Gerlach, 15° C.	NazO Tunnermann. 15° C,	NarO Dalton.
0 1 2 3 4 5	1.000 (7)	1.000 1.012 23 35 46 59	1.000 1.015 29 43 58 74	.9992 (?) 1.0135 273 411 654 699	1.064
6 7 8 9 10	1.115	70 81 92 .108 15	89 104 19 88 46	848 . 1003 159 319 483	1.1867
11 19 18 14 15	1.170	26 37 48 59 70	60 75 90 .908 19	651 825 -2004 196 372	1.2188
16 17 18 19 20	1.295	81 91 .202 13 25	88 45 58 70 85	482 586 694 805 918	1.9925
21 22 28 24 25	1.879	36 47 58 69 79	.800 15 29 41 55	.3085 155 977 404 584	1.8407
96 97 28 29 30	1.889	.300 10 21 33	69 81 95 .410 28	669 806 951 .4099 258	1.4188
81 88 83 84 85	1.884	48 51 68 74 84	88 50 69 75		1.4815

Soda-Continued.

Per cent.	Na H O U. S P. 15° C.	Na H O Gerlach, 15° C.	NazO Gerlach. 15° C.	NasO Tunnermann, 15° C.	NasO Dalton,
36 37 38 39 40	1.487	.895 .405 15 20 . 87	.500 15 80 48 58		1.5437
41 42 43 44 45	1.488	47 56 68 78 88	70 88 97 .610 23		
46 47 48 49 50	1.640	99 ,508 19 29 40	37 50 63 78 90		•
51 52 58 54 55	1.591	50 60 70 80 91	.705 19 80 45 60		
56 57 58 59 60	1.643	.601 11 22 33 43	. 85 .800 .15 .80		
65 70	1.095 1.748				

Ammonia.

- 1										
	5.5 5.5	eri		끃	å. €.	1 1	Apparent expansion for 1° F.	. ه ي	الغظ	Coefficient of expansion (true)
- 1	HA.	80			7.8	t I	عم	8	. ⊳,≱ಲ	45
- 1	ಹೆತ	£3	0	₫	별했으	e#	M.	82.5	# .	1 2 5 .
٠	ಕ ್	24	, a	Griffin, 15° C.	-5T	ାଞା	# F	400	ă T	H K C
님	<u> </u>	6.5	C 1	, A &	\$1,5	8	25	8= I	ಕ್ಷಿಪ್ರಕ್ಷತೆ.	ಕೆ.ಕ್ಷ್ಷ
8	52	1 B 8	•	<u> </u>		Differences.	3 2	1 D	rue den vacuo. ter at 1.0000.	oefficient pansion for 1° C.
Ŀ	E Ž	이 이 등	g	רי	809	별	2.5	_ ಕ್ಷಿಲ್≎	2835	8 200
Per cent.	Carius (U. i reduced (J. Otto, (Frese- nius) at 15° C.	Ure, at 15° C.	J. J.	Observed at 15 C. Water a 15° C.=1.000.	Ā	4 ~	Observed at 15° C. Water at 4° C.=1.0000.	True density in vacuo. Water at 4° C.= 1.0000.	ర
_ -								00045	00045	
9	1.0000	1 0000(?)	1.00000 .99590	1.00000 .99500	1.00000 .99388	412	.00010	.99915 503	.99915 503	.000206
뇞	.9909		.99690	.99500	.99389	408	11	095	096	990
ž	9910		100	186	180	403	12	8693	8694	991
2	8108. 0890		0/10	0104	001	396	12	907	298	610
012845	1.0000 .9959 .9915 .9879 .9830 .9789	.9784	155 8715 271 7801	8784 886 7991	8777 381 7991	390	18	297 7907	7909	234 234 249 284
- 1		1		l		908	14		525	ī
낅	.W(45	90	419 029 6606	602 213	606	385 385	15	523 138	140	200
á	0880	620	8808	6928	221 6836	3%5	16	6753	6756	309
2	0880	98	950	445	461	372	16	382	385	32
6 7 8 9	.9748 .9708 .9669 .9680 .9692	46 08 670 33 595	250 5891	445 063	097	372 367	17	015	019	277 29- 309 32 33
- [ł I		ł	2 ~OE	862	18	5653	5657	ı
44	.9554 .9518	57 19	901	918	9190	355	10	200	303	36
12	.9482	1.5	481 080 4663 305	5690 316 4946	5735 880 032	348	19 20	299 4951	956	85- 369 877
14	9147		305	5:9	4691	341	21	610	615	40
11 12 18 14 15	.9447 .9412		3961	215	357	834	22	277	282	40
16	.9877 .9344 .9811 .9280		610 286 2951	3855 454	028	829	23	3988	8994	43: 44:
16 17 18 19 20	.9344		286	454	3703	325 321	24	623 303	629	44
18	.9811		2951	141	342	331	24	303	1 309	46
19	.9280		595 239	2789 439	065	317	25	2986	2993	48
20	.9248			439	2752	313	26	673	680	49
21 22 23 24 25	.9216 .9188 .9158 .9129 .9102		1969 529 195 0969 530	092 1745	443	309	27 28 28 29 30	364	371	519
22	.9188		522	1745	136	307	28	058	066	52
23	.9108		196	4416	1883	303 800	20	1757 455	1765 468	544 500
3	OLDO		1000U	405 066 0728	538 234	299	900	156	164	570
- 1				ł			1	ĺ		1
26 27 28 29	.9074		192 .89853	893	0936	298	81	0859	0868	590 600
27	.9048		.89853	070 .89780	639	297	82	562	571	606
20	.9074 .9048 .9022 .8996 .8971		•••••	.89730	843 052 .89768	297 296 291	33	266	571 275 .89985	62: 63: 65:
2	.8096			402 076	90266	291 284	34 85	89975 6.2	. 89985	65.
- 1			•••••	0/0	.00100	201	φü	27.0	102	000
81 82 38 84 85	.8947 .8994 .8902 .8880 .8859	[8754						
200	.0000	1	• • • • • • • • • •	488 118		<u> </u> [·····]	· • • • • • • •			
24	,0000 0000			118	····	·····	· · · · · · · ·			
2	.0000 ARKA			7798 484			· · · · · · · · ·	••••		
~1	.000			301					· · · · · · · · ·	
36										

Water at 59 - F. (15 - C.)-170000.

Per Cent.	Sulphuric Acid (H ₂ SO ₄)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Correction for 1° F. above or below 59° F.	Nitric Acid (HNO ₃).	Dif. in Percent- age Cor- respond'g witn Dif. i.i Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Hydro- chloric ^cid (HCl).	Dif. in Percent- age Cor- respond'g with Dif in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.
1	1.0066	0153	.015	1 0057	.0175	.013	1 00496	0202	.016
$\frac{2}{3}$	132	.0152	.017	114	.0175	.014	0992	.0202	.017
3 4	198 265	.0152	.018 .020	172 229	.0174	.017	1486 1979	.0203	.018 .019
5	333	.0149	021	287	.0173	.024	2472	.0203	.020
6	402	.0145	.023	345	.0172	.027	2965	.0203	.022
7 8	471	0145	.024 .026	404 464	0170	.031	3457 3 9 49	.0203	.024 .026
9	541 61!	.0143	.027	524	.0168	.037	4442	.0203	.028
10	682	.0141	.028	584	.0167	.040	4936	.0202	.030
11	753	.0141	.029	644	.0166	.043	5433	.0202	.032
12 13	825	.0139	.030	705 766	.0165 .0164	.0 46 .0 49	5931 6431	.0201	.034 .036
14	897 970	.0139	.033	824	.0163	.051	6931	.0200	.038
15	.1043	.0137	.093	889	0163	.054	7431	.0200	.040
16	117	.0135	.033	951	.0162	.057	7933	.0199	.042
17	191	.0135	.031	. 1013	.0161	.060	8437	.0198	044
18	265	0135	.034	075	.0161	.063	8944	.0197	.046
19 20	340 415	0133	.035	138 201	.0161 .0160	.066 .069	9453 9963	.0196 .0196	.048 .050
21	491	.0132	.037	264	0160	.071	.10474	.0196	.053
22	567	.0133	038	328	.0159	.074	0986	.0195	.055
23	644	.0130	.089	393	.0158	076	1499	.0195	.057
24 25	722 801	.0128	.040 .041	456 521	.0157 .0156	078 .079	2014 2531	.0194 .0193	.059 .061
26	880	.0127	.041	586	.0155	.080	3052	.0192	.063
27	959	.0127	.042	652	.0154	.081	3577	.0191	.065
28	.2038	.0127	.042	718	.0158	.081	4103	.0190	.067
29 30	118 198	.0125 .0125	.043 .013	784 850	.0153 .0152	.082	4628 5147	0190 .0192	.069 .071
31	279	.0124	.043	915	01.2	.083	5659	0195	.078
32	361	.0123	.044	981	.0152	.084	6164	.0198	.076
33	443	.0122	.044	.2047	.0152	.085	6668	.0199	.078
34 35	526 609	.0120	.044 .041	113 179	.0159	.085 .086	7170 7568	.0200	.0 ^0 .081
36	693	.0119	.044	244	.0152	087	8162	.0202	.082
37	777	.0119	.(144	310	.0151	.087	8654	.0203	.083
38	863	.0118	.014	376	.0151	.088	9145	.0204	.085
39 40	947	.0118	.044 .044	448 509	.0151 .0151	.089 .090	9535 .20000	.0205	.088
41	120	.0115	.044	576	0150	.091	0545	.0222	. 101
42	207	.0115	.044	643	.0150	.093	0885	0227	. 105
43	295	.0114	.044	711	.0149	.094		l ———	
44 45	384 474	.0112	.044 .043	778 845	.0149 .0148	.096 .098			
46	565	.0110	.043	913	.0148	.100		i	• • • • • · ·
47	658	.0108	.043	980	.0149	. 103		
48	753	.0105	.043	.3045	.0152 .0155	.105			· · · · ·
49 50	849 946	.0104	.043 .044	109 172	.0158	.107			
51	.4044	.0102	.044	284	.0160	.112			
52	143	.0101	.044	296	.0162	.114			· · · · · · .
53 54	243 343	.0100	.044 .044	357	.0165	.116			
			1134	415	.0170	.118			

Water at 59° F. (15° C.)-1.0000.

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Phon- phoric Acid (B ₃ PO ₄)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr of .0001.	Mean Cor- rection for 1° F. above or below . 9° F.	Acetic Acid HG ₂ H ₃ O ₂ .	Dif. in Percent- age Cor- respond'r with Lif. in Sp. Gr. of .0001	Mean Cor r ction for 1° F. above or below 50° F.	Ammonia (NH ₃).	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor rection for 1° F. above or below . 59° F.	l er Cent,
1.00565 1131 1698 2265	.0177 .0177 .0176 .0176	.017 017 .018 .018	1.0015 030 045 060	.067 .067 .067	.054 .057 .060 .665	.9959 .9918 .9878 .9838	.0244 .0244 .0250 .0250	.024 .027 .029 .031	1 2 3 4
2833 3405 3985 4572 5166	.0176 .0175 .0172 .0170 .0168	.019 .019 .020 .020 .020	075 091 106 121 1 5	.067 .067 .067 .067 .071		.9799 .9761 .97.2 .9681 .9647	.0 59 .0 63 .0259 .0.63 .0270	.033 035 038 040 043	5 6 7 8 9
5768 6313 6981 7592 8206	.0166 .0165 .0164 .0164 .0163	.021 .021 .022 .023 .028	150 165 179 193 208	.067 .067 .071 .071 .067	.095 .100 .105 .110 .117	.9010 .0574 .9538 .9593 .9460	0270 .0278 .0278 .0286 .0`91	.046 .050 .054 .058 .062	10 11 19 13 14
1824 9451 10084 0719 1359	.0162 .0160 .0159 .0158 .0157	.024 .024 .025 .025 .026	222 236 250 267 270	.071 .071 .071 .071 .071	. 124 . 133 . 149 . 1 !9 . 156	.9436 .9463 .9370 .9338 .9807	.0803 .0303 .0303 .0313 .0323	.066 .069 .073 .076 .079	15 16 17 18 19
2006 2660 3821 3989 4666	.0155 .0153 .0151 .0150 .0148	.026 .027 .027 .028 .028	293 307 320 333 346	.071 .071 .077 .077	. 109 178 . 188 . 191 . 199	.9.75 .9244 .9214 .: 183 .9153	0313 0323 0333 0323 .0333	.083 .087 .090 .094 .097	20 21 22 23 24
5352 6045 6740 7448 8164	.0146 .0145 .0144 .141 .0139	.029 .029 .030 .030 .031	359 372 384 397 400	.077 .077 .083 .077 .083	.207 .215 .223 .231 .240	.91:3 .9094 .9064 .9034 .9005	.0338 .0345 .0333 .0383 .0845	.100 .104 .107 .112 .118	25 26 27 28 29
8888 9618 .20354 1006 1844	.0138 .0137 .0136 .0185 .0134	.031 .031 .032 .032 .032	421 433 445 456 468	.083 .023 .0-5 .091 .083	.250 .260 .270 .280 .290	.8977	.0357	.124	30 31 32 33 34
2598 3358 4123 4893 5670	.0133 .0132 .0131 .0130 .0159	.033 .033 .033 .034	479 490 501 511 522	.051 .051 .051 .100 .091	.300 .312 .324 .336 .348				35 36 37 38 39
6454 7245 1045 8814 9672	.0127 .0126 .0125 .0124 .0122	.034 .034 .034 .034 .034	532 542 552 561 571	.100 .100 .100 .111 .170	.360 .370 .380 .390 .400				40 41 42 43 44
.30500 1336 2186 2014 3015 4760	.0121 .0120 .0118 .0117 .0115 .0114	.034 .034 .034 .034 .034 .634	580 589 593 607 616 624	.111 .111 .111 .111 .111 .125	.420 .430 .445 .460 .475				45 46 47 48 49
5670 6575 7481 0357 9322	C113 .0112 .0110 .0109 .0108	.034 .034 .034 .034 .031	632 640 647 655 662	.1.5 .1.5 .1.9 .1.5	.495 .515 .540 .5% .5 0				50 51 52 53 54 55

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CONTINUED.

Per Cent.	Sulphuric Acid (H ₂ SO ₄)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Nitric Acid (HNO ₃)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001	Mean Cor- rection for 1° F. above or below 59° F.	Hydro- chloric Acid (HCl).	Dif. in Percent- age t'or- respond'g with Dif. in Sp Gr. of. 0001.	Mean Correction for 1° F. above or below 59° F.
58	546	.0098	.044	525	.0178	122			
57	649	.0097	.044	580	.0'81	. 125			
58	753 .	.0096	.044	635	.0184	.128	. .		
59	858	.0095	044	688	.0187	.182			
60	964	.0095	.044	741	.0190	. 136			
61	.5070	.0094	.045	793	.0198	.141			
62	177	.0094	.046	845	.0196	.147			
63	285	.0098	.047	896	.0199	.152			
64	394	.0092	.048	946	.0,03	.157	· · · · · · · ·		• • • • • •
65	504	.0091	.049	996	.0208	.162	.		· • • • • • •
66	615	.0090	.050	.4045	.0213	. 167			
67	727	.0089	.051	094	.0218	. 172	. 		
68	839	.0089	.052	143	.0224	.177			
69	952	.0088	.053	190	.0230	.182	· · · · · ·		
70	.6064	.0089	.054	233	.0236	. 187		• • • • • • • •	
71	176	.0089	.055	274	.0242	.198			.
72	288	.0089	.055	314	.0249	. 199			
78	399	.0090	.054	352	.0255	.205	 .		
74	511	.0089	.054	388	.0260	.212			.
75	623	.0089	.054	423	.0265	.220			
76	734	.0090	.053	459	.0278	.228			
77	846	:0089	.053	494	.0274	. 236			
78	957	.0090	.053	529	.0278	.254			
79	.7068	.0090	.052	563	.0281	.261			
80	179	.0090	.052	597	0284	.267	. 		
81	290	.0090	.052	621	.0286	.273	. 		
82	400	.0091	.053	655	.0288	. 276	 .		.
83	509	.0092	.054	699	.0580	.279	 .		· · · · • • • ·
84	615	.0094	.056	733	.0291	.280	· • • • • • •		· · · · · · · ·
85	718	.0097	.058	767	.0291	.281	· • • • • • •		
86	818	.0100	.060	801	.0291	.282	.]. 	
87	913	.0105	.062	835	.0290	.283			
88	.8003	.0111	.064	869	.0288	.284			
89	083	.0125	.066	803	.0286	.285			
90 ·	153	.0143	.076	938	.0285	.285			· • • • • • • •
91	213	.0167	.088	973	.0284	.284			
92	263	.0200	.106	.5008	.0283	.284		1	.
93	303	.0250	. 132	()44	.0280	.283			.
94	335	.0313	. 160	080	.0278	.283	 -	· • • · · • • ·	
95	362	.0370	,195	116	.0276	.282		· · · · · ·	
96	384	.0455	.240	152	.0273	.282	.	[. .	
97	395	.0909	.480	188	.0270	.281	. .		[
98	405	, 2000	1.060	224	.0267	.280		[
99	410	.2000	1.000	262	.0264	.279			[
100	390	.0500	. 255	300	.0260	.278			

To convert per cent. of $\rm H_2SO_4$ to per cent. of $\rm SO_3$, multiply by .81683. To convert per cent. of $\rm SO_3$ to per. cent. of $\rm H_2SO_4$, multiply by 1.225. To convert per cent. of $\rm HNO_3$ to per cent. of $\rm N_2O_{50}$, multiply by .85714.

CONTINUED.

Phos- phoric Acid, (H ₃ PO ₄).	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Acetic Acid E0 ₂ E ₂ 0 ₂ .	Dif. in Percent age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Ammonia (NH ₃).	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Correction for 1° F. above or below 59° F.	Per Cont.
.40257	0107	.035	669	.143	.615				56
1202	.0106	.035	675	.167	.645				57
2155	.0105	.085	683	.148	.675				58
8120	.0104	.035	688	.167	.725				59
4095	.0108	.035	694	. 167	.775				60
5070	.0103	085	700	. 167	.825				61
6067	.0102	.035	706	.167	.875				63
7064	.0101	.036	711	. 200	.920				63
8068	.0100	.036	716	.200	.960				64
9080	.0099	085	721	.200	1.000				65
•			726						
.50100	.0098	.036		.200	1.000	· · · · · · · ·		· · · · · · · ·	66
1128	.0097	.037	730 734	.250	1.100			• • • • • • •	67
2164	.0096	.038	738	.250	1.150			· · · · · · · ·	68
8208 4260	.0096	.038	743	.250 .250	1.200 1.250				69
4600	.0095	.008	1					••••	70
5319	.0094	.039	746	.250	1.500				71
6385	.0093	.040	749	.333	2.000	.			72
7459	.0093	.010	751	.500	2.500				78
8540	.0092	.041	758	,500	3.000				74
9630	.0092	.041	755	.500	4.000			· • • • · • · ·	75
60727	.0091	.042	756	1.000	5.000		1		76
1983	.0091	.043	757	1.000	6.000				77
3044	.0090	041	757	1.500	8.000				78
4164	.0089	.035	757	2.000	10.000				79
5289	.0089	.035	757	1.000	6.000				80
6420	.0088	.034	756	1.000	5.000	1			81
7558	.0088	.034	755	1.000	4.000			• • • • • • • •	8;
8706	.0087	034	758	.500	3.000				83
9860	.0086	.033	751	.500	2 500				84
.71020	.0086	.033	748	.333	2.000		l		85
.11020	.0000			l '					
			745	.333	1.750			• • • • • • •	86
			740	.200	1.500			• • • • • • •	87
			735	.200	1.250			• • • • • • •	88
			729 722	.167	1.000				89
	· • • • • • •		122	. 143	.810				90
	l 	l	714	. 125	.720				91
	<i></i>	[<i>.</i>	705	.111	. 640				92
	ļ	 .	695	.100	. 590	. 			98
	ļ		683	.083	.500			 .	94
	¦. 	[.	669	.071	.420				95
	t	1	653	.063	.370				96
	ı	l	634	.053	.300				97
• • • • • •	ı · · · · · · · · · · · · · · · · · · ·	l	613	.048	.275				98
• • • • • • • •	·	1	589	.042	.250	l			99

To convert per cent. of N_2O_8 to per cent. of HNO_3 , multiply by 1.1667. To convert per cent. of H_2PO_4 to per cent. of P_2O_5 , multiply by .7245. To convert per cent. of P_2O_5 to per cent. of H_3PO_4 , multiply by 1.3808.

Relations of Weight to Volume in Fluids of Different Specific Gravities.

A. B. LYONS, M. D., DETROIT, MICH,

Among the instructions given to the committee of revision and publication of the U. S. Pharmacopæia was a clause enumerating the tables to be appended to the Pharmacopæia of 1880. This list included a weight and volume table to facilitate the use of parts by weight in compounding, prescribing and dispensing fluid preparations. The committee did not find it possible in the limited time at their disposal to supply such a table, but several tables have been subsequently published which supply at least partially this desideratum.

A more complete table has seemed to the writer to be preferable to one including only a limited number of particular liquids, and the accompanying table is offered as a desirable one to incorporate in a future edition of the Pharmacopæia.

It will be seen that no specific articles are named. The table merely shows the relation of volume to weight in fluids of various specific gravities, giving in addition the actual weight in grains and ounces of a given measure of fluid, and the measure in minims and fluid ounces of a given weight of the same.

The specific gravities in the table range from .700 to 1.850. Terms not given in the table can be readily supplied by interpolation. Thus the specific gravity of dilute hydrochloric acid is stated as 1.049. The table gives the "specific vol." corresponding to sp. gr. 1.050 as .9524, with a correction of .0009 for difference in sp. gr. of .001. The specific volume is therefore .9533. From col. 4 of the table we find that 100 oz. av. of a fluid having sp. gr. 1.050, measure 91.45 fl. oz. The correction for a difference of .001 in specific gravity, found by substracting this from the preceding term (removing decimal point one place to the left) is .087 and the required value is 91.45+.087=91.537. For practical pur-

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poses it is easy to make the required interpolation by a mental calculation.

It is assumed throughout this table that water at 15° C. (59° F.) furnishes the unit of comparison. In a similar table published some time since by the writer (Am. Journ. of Phar., Dec., 1883) it was assumed that water at its maximum density was to be understood as the standard of comparison generally adopted. As a matter of fact usage still varies on this point, the continental writers adopting water at its maximum density, English authorities, water at the temperature of observation (60° F.) while among Americans there is no uniformity. After mature consideration the writer has decided in favor of a practice similar to that of the English, making water at the temperature of observation (15°.)O the standard of comparison. The reasons for his preference are several; among them those regarded as especially cogent may be briefly stated as follows:

- 1st. All instruments—hydrometers and pycnometers—in use in this country are constructed on this basis.
- 2d. An instrument so constructed can be readily verified at any moment, the standard of comparison being always at hand. If, however, water at its maximum density is selected as the standard comparison, direct verification of the instrument is impossible, for, even if it were practicable under ordinary circumstances to secure the required temperature, and to make a weighing at that temperature, there still remains the correction to be made for expansion of glass between 4° and 15° C.

Of course one can fix in his memory the fact that a flask which is marked "100 grams at 15° C." will hold of distilled water at that temperature 99.915 grams, in other words that water at 15° C. has a specific gravity, compared with water at maximum density of .99915, but such a statement cannot but be confusing to one who only occasionally makes use of an instrument of this kind. The majority of those who use specific gravity tables are liable to make mistakes if they attempt to "correct" their observations. Hence the tables should give as nearly as possible the figures obtained by direct observation. All specific gravities, whether of solids or liquids, which are obtained by direct weighing, unless the standard of comparison be water at the same temperature as that

Potassa.

Per cent.	K H O U. 8. P. 15° C.	KHO Gerlach. 15° C.	K. O Gerlach. 16° C.	K ₂ O Tunnermann. 15° C.	K ₂ O Daiton.
0 1 2 8 4 5	1.000 (7)	1.000 1.009 17 25 38 41	1.000 1.010 20 30 30 48	.9093 (?) 1.0066 182 276 873 478	1.064
· 6 7 8 9 10	1.077	49 58 65 74 88	58 68 78 80 99	869 667 789 878 979	1.1158
11 18 18 14 14	1 194	92 .101 11 19 28	.110 21 32 43 54	.1086 198 800 420 586	
16 17 18 19 20	1.175	87 46 55 66 77	66 78 90 .902 15	654 774 896 : 3020 148	1.1750
21 22 23 24 24 25	1.280	88 98 . 209 20 30	80 42 56 70 85	977 408 548 680 818	1.3113
96 27 28 29 30	1.288	41 52 64 76 88	.800 13 26 40 55	962 .3108 .357	1.369
81 82 88 84 85	1.349	.300 11 24 36 49	70 85 .409 16 81		1.425
36 37 38 39 40	1,411	61 74 87 .400 11	45 60 75 90 .504		1.4743
41 42 43 44 45	1.475	95 36 50 62 74	223 89 54 70 84		1,5640
46 47 48 49 50	1.539	88 99 .511 27 89	.600 15 80 - 45 60		
51 52 58 54 55	1.604	52 65 78 90 .604	76 90 .705 20 83		

Potagea-Continued.

Per cent.	K H O U. S. P. 15° C.	KHO Gerlach. 15° C.	K ₂ O Gerlach. 15° C.	K ₂ O Tunnermann. 15° C.	K ₂ O Dalton.
56 57 58 59 60	1.007	.618 80 41 55 67	.746 62 80 95 .810		· · · · · · · · · · · · · · · · · · ·
6 5 70	1.799 1.790				

Soda.

Per cent.	Na H O U. S. P. 15° C.	Na H O Gerlach, 15° C.	NasO Gerlach, 15° C.	NacO Tunnermann. 15° C.	NarO Dalton.
0 1 2 3 4 5	1.000 (7)	1.000 1.018 28 85 46 59	1.000 1.015 29 43 58 74	.9992 (7) 1.0135 278 411 554 699	1.084
6 7 8 9 10	1.115	70 81 92 .108 15	89 .104 19 82 45	848 .1003 159 319 488	1.1867
11 19 18 14 15	1.170	26 37 48 59 70	60 75 90 .203 19	651 825 .2004 196 373	1.2188
16 17 18 19 20	1.995	81 91 .209 13 25	88 45 58 70 85	482 586 694 805 918	1.2825
21 22 28 24 25	1.279	86 47 58 69 79	.800 15 29 41 55	. 3035 155 277 404 584	1.8467
26 27 28 29 30	1.839	90 . 300 10 21 38	69 81 95 .410 288	669 806 951 .4099 258	1.4188
81 82 83 84 85	1.884	48 51 68 74 84	88 50 69 75 90		1.4815

Soda-Continued.

Per cent.	Na H O U. S P. 15° C.	Na H O Gerlach. 15° C.	NazO Gerlach. 15° C.	NazO Tunnermann. 15° C.	NazO Dalton.
36		.895	.500		
37		.405	15	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
38		15	80	1	!
89		20	48		*
40	1.437	. 87	58		1.5437
41		47	70		
42	.	56	83	1	!
43		68	97		.
44		78	.610		
45	1.488	68 78 88	23		
46		99	87		
47	l . l	.508	50		• .
48		19	63 78	1	
49		29	78		
50	1.540	40	90		
51		50	.705	1	
52		60	19		
58	l	70	80	1	
54		80	45	1	
55	1.591	91	60		
56	l	. 6 01	70		
57	l l	11	85	1	l
58		22	.800	1	
58 59		22 83	15	1	!
60	1.648	43	80		
65	1.095		ļ		ļ
70	1.748		l		

Ammonia.

Per cent.	Carlus (U. S. P.) reduced to 15° C.	J. Otto, (Fresenius) at 15° C.	Ure, at 15° C.	Griffin, at 15° C.	Observed at 15° C. Water at 15° C.—1.000.	Differences.	Apparent expansion for 1° F.	Observed at 15° C. Water at 4° C.=1.0000.	True density in vacuo. Water at 4° C.= 1.0000.	Coefficient of ex- pansion (true)
-	Carius (U. S. reduced to C.	J. Otto, (Free nius) at 15° C	s, at 15° C.	Griffin, 15° C.	ed at 18	1 9	terpa r 1° F.	at 12	\$ 5 C \$	tofe (tru
-	Carius (U. S. reduced to C.	J. Otto, (Fre nius) at 15°	e, at 15° C.	Griffin, 15° C.	Water 7 ater 1.00	륈	1. 1. 1.	Ser et	15 of	10 D
-	Carius (U. reduced C.	J. Otto, (F nius) at 1	s, at 15°	9-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	2 T	💀	1 te	230	₩ 4	1 =
-		J. Otto, nius) at	9, at 15	53	881					
-		J. Otto, nius)	3 8 6	⊕≋		IAI	8 5	78 × 77	vacuo. ter at 1.0000.	1 5 5 C
-		J. Ott	4		l ≨FC	5	2 -	¥	80 50	2.2.
-		0.4	4			5	3 8	a 0	975	E E
-		's'		-	1	l¥il	2.8	ಶಿ ರು	2537	عقادا
-			5	J. J.	1 200	ובו	₹"	8	4	2
0	1 0000									
1 2		1 0000(2)	4 00000	4 00000				00018	.99915	
3	1.0000	1 0000(?)	1.00000 .99590	1.00000 .99590	1.00000 .99588	412	.00010	.99915 503 095	MINOR.	.000206
꾉	.uou		.99690	, yychio	. 995895	408		000	503 096	.000300
	.9915		155	186 8784 386	180		11	Office	(190)	220 234
8	.9872		6715	8784	8777 881	403	12	8693	8694	234
4	.9830		271	386	881	396	12	297 7907	298	249 264
5	1.0000 .9959 .9915 .9872 .9830 .9789	.9784	155 8715 271 7801	7991	7991	890	18	7907	7909	264
	9748	46	419	602	606 221 6836	385	14	523	525	279 294 309 324 839
6 7 8 9	.9748 .9708	46 08 670	050	602 213	2521	385	15	138 6753	140	294
ėl.	0880	800	1 0000	6928	REAR	385	16	6753	6756	309
ង	.9669 .9680 .9682	0.00	250 5891	445	464	372	16	960-0	385	894
٠.٦	.9000	83 595	1001	063	097	367	17	382 015	019	890
44	.NONE	560	DOM	003	091	1		1		
11 12 13 14 15	.9554 .9518	57 19	481 090	5690 316	5735 8H0	862 355	18 19	5653 299 4951	5657	354 369 875 401 417
12	.9518	19	080	316	340	355	19	209	303	369
13	.9482	1	4663	4946	0:353	348	20	4951	956	875
14	.9447		305	519	4691	341		610	615	401
15	.9412	1	3961	215	357	334	22	277	2012	417
16	.9877 .9344 .9811 .9280 .9248		610	3855 454	028	829 82 5	28	8988	8994	432 448
17	9844	1	998	451	3703	9:35	24	623	629	448
10	9811		9051	141	342	321	24	303	309	464
161	0000		KOK	141 2789	065	317	95	2986	2993	480
16 17 18 19 20	0349		296 2951 595 239	439	2752	313	25 26	673	680	496
~		l			1 2102	li	20			t
21 22 23 24 25	.9218 .9188 .9158 .9129 .9102		1862 522 195	092 1745 405	443	309 307	27 28 28 29	364 058	371	512
22	.9188		522	1745	136	307	28	058	066	528
23	.9158		195	405	1893	303	28	1757	1765	544 5(X) 576
24	.9129	1	0869	066	538	800	29	455	463	500
25	.9102		0969 580	0728	234	299	30	156	164	576
26	.9074		199	393	0986	298	81	0859	0868	590 606 622 638
97	0049	1	192 .89653	000	639	90~	82	562	671	COS
20	990	··· ····	.09090	070 .89730	343	297 296	33	266	977	699
26 27 28 29 20	.9048 .9022 .8996 .8971	1	••••••	402	010	291	34	.89975	275 .89985	690
3	.000	·····		402 076	052 .89768	284	34 85	6.2	702	655
~				076	.59705	201	80	0.2	102	600
81 82 88 84 84	.8947 .8994 .8902 .8880 .8859	l		8754						
82	.8994	1	[<u>.</u> .	483	1		. 			• • • • • • •
88	,8902		ا ا	113	l. <i></i> 	l l			1	
84	.8880	1	l	7798	l . .	ا ا				
85	.8859	1		484		J				
- 1									į į	ı
36	.8686						· · · · · · · · · · · · · · · · · · ·	·		

Water at 59 · F. (15 · C.)-170000.

Per Cent.	Sulphuric Acid (H ₂ SO ₄)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Nitric Acid (HNO ₃).	Dif. in Percent- age Cor- respond'g with Dif. i.i. Sp. Gr. of .0001,	Mean Cor- rection for 1° F, above or below 59° F.	Hydro- chloric * cid (HCl).	Dif. in Percent- age Cor- respond'g with Dif in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.
1	1.0066	0153	.015	1 0057	.0175	.012	1 00496	0202	.016
2	132	.0152	.017	114	.0175	.014	0992	.0202	.017
3	198	.0152	.018	172	.0174	.017	1486	.0203	.018
4	265	.0149	.020	229	.0174	021	1979	.0203	.019
5	333	.0147	.021	287	.0173	.024	2472	.0203	.020
6	403	.0145	.023	345	.0172	.027	2965	.0203	.022
7	471	.0145	.024	404	0170	.031	3457	.0203	.024
8 9	541	0143	.026	4/4 524	.0169	.034	3949	.0203	.026
10	611	.0143	.028	584	.0167	.040	4442 4936	.0203	.030
11	753	.0141	.029	644	.0166	.043	5433	.0202	.032
12	825	.0141	.030	705	.0165	.046	5931	.0203	.034
13	897	.0139	031	766	.0164	049	6431	.0200	.036
14	970	.0137	.032	824	.0163	.051	6931	.0200	.038
15	.1043	.0137	.033	889	.0162	.054	7431	.0200	.040
16	117	.0135	. 033	951	.0162	.057	7933	.0199	.042
17	191	.0135	.031	1013	.0161	.060	8437	.0198	044
18	265	0135	.034	075	.0161	.063	8944	.0197	.046
19	340	0133	.035	138 201	.0161	.066 .069	9453 99 6 3	.0196	.048
20	415	.0133	.036		.0160	1	1	.0196	
21	491	.0132	.037	264	9160	.071	.10474	.0196	.053
22 23	567 644	.0133	.038	1 328 1 392	.0159	.074	0986 1499	.0195 .0195	.055 .057
23 24	722	.0128	.040	456	.0157	078	2014	.0194	.059
25	801	.0127	.011	521	.0156	.079	2531	.0193	.061
26	880	.0127	.041	586	.0155	.080	3052	.0192	.063
27	959	.0127	.042	652	.0154	.081	3577	.0191	.065
28	.2038	.0127	.012	718	.0158	.081	4103	.0190	.067
29	118	.0125	.043	784	.0153	.082	4628	.0190	.089
30	198	.0125	.043	850	.0152	.083	5147	.0192	.071
31	279	.0124	.043	915	.0152	.083	5659	0195	.073
32	361	.0123	.044	981	.0152	.084	6164	.0198	.076
33	443	.0122	.044	.2047	.0152	.085	6668	.0199	.078 .0~0
34 35	526 609	.0120	.014	113 179	.0152	.086	7170 7568	.0200	.081
		1	1	ł	į	087	8162	.0202	.082
36 37	693 777	.0119	.044	244 310	.0152	.087	8654	0203	.083
38	863	0118	.014	376	.0151	.088	9145	.0204	.085
39	947	0118	044	443	.0151	.089	9535	.0205	.088
40	.3033	.0116	.044	509	.0151	.090	.20000	.0215	.095
41	120	.0115	.044	576	0150	.091	0545	.0222	.101
42	207	.0115	.044	643	.0150	.093	0885	.0227	. 105
43	295	.0114	.044	711	.0149	.094			
44	384	.0112	.044	778	.0149	.096			· · · · · ·
45	474	.0111	.043	845	.0148	.098		:	· · · · · · · ·
46	565	.0110	.043	913	.0148	.100		· · · · · · · · ·	
47	658 753	.0108	.043	980 .3045	.0149	.108			
48 49	849	.0105	.043	109	.0155	.107		l	
50	946	.0103	.044	172	0158	.110			
51	.4044	.0102	.044	234	.0160	.112			
52	143	.0101	.044	296	.0162	.114			
53	243	.0100	.044	357	.0165	.116			
54	343	.0100	.044	415	.0170	.118			· · · · · · •
55	444	.0099	.044	470	.0175	.120		!	l

Water at 59° F. (15° C.)-1.0000.

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Phos- phoric Acid (H ₃ PO ₄)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr of .0001.	Mean Cor- rection for 1° F. above or below . 9° F.	Acetic Acid EC ₂ E ₃ O ₂ .	Dif. in Percent- age Cor- respond'r with Lif. in Sp. Gr. of .0001	Mean Cor r ction for 1° F. above or below 59° F.	Animonia (NH ₃).	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor rection for 1° F. above or below . 59° F.	I er Cent.
1.00565 1131 1698 2265 2833	.0177 .0177 .0176 .0176	.017 017 .018 .018 .019	1.0015 080 045 060 075	.067 .067 .067 .067 .067	.054 .057 .060 .665	.9959 .9918 .9818 .9838 .9799	.0244 .0244 .0250 .0250	.024 .027 .029 .031 .083	1 2 8 4 5
8405 3985 4572 5166 5768	.0175 .0172 .0170 .0168 .0166	.019 .020 .020 .020 .021	091 106 121 1 5 150	.067 .067 .067 .071	075 080 085	.9701 97.2 .9681 .9647 .9010	.0 63 0259 .0.68 .0270 .0270	.035 .038 .040 .048 .046	6 7 8 9
6313 6981 7592 8206 8824	.0165 .0164 .0164 .0163 .0162	.021 .022 .023 .028 .024	165 179 193 208 222	.067 .071 .071 .067 .071	.100 .105 .110 .117 .124	.0574 .9538 .9593 .9469 .9436	.0278 0278 0286 .0194 .0303	.050 .054 .058 .062 .066	11 12 18 14 15
9451 .10084 0719 1359 2006	.0160 .0159 .0158 .0157 .0155	.024 .025 .025 .026 .026	236 250 267 279 293	.071 .071 .071 .071 .071	.133 119 .159 .156	.9463 .9370 .9338 .9807 .9.75	.0303 .0303 .0313 .0323 .0313	.069 .073 .076 .079 .083	16 17 18 19 20
2660 3321 3989 4666 5352	.0153 .0151 .0150 .0148 .0146	.027 .027 .028 .028 .029	307 320 333 346 359	.071 .077 .077 .077	173 .183 .191 .190 .207	.9244 .9214 .1183 .9153 .9153	0323 0333 0323 0323 0333	.087 .090 .094 .097 .100	21 22 23 24 25
6045 6740 7448 8161 8888	.0145 .0144 .141 .0189 .0138	.029 .030 .030 .031 .031	372 384 397 400 4£1	.077 .088 .077 .083	.215 .223 .231 .240 .250	.9094 .9064 .9034 .9005 .8977	.0345 .0333 .0333 .0845 .0857	.101 .107 .112 .118	26 27 28 29 30
9618 .20354 1096 1844 2598	.0137 .0136 .0185 .0134 .0133	.031 .032 .032 .032 .033	433 445 456 468 479	.0%3 .0 8 .091 .080 .001	.260 .270 .280 .290 .300				31 32 33 34 35
8358 4123 4893 5670 647.4	.0132 .0131 .0130 .0159 .0157	.033 .033 .034 .034	490 501 511 522 532	.0 1 .001 .100 .091 .100	.312 .324 .336 .348 .360				36 37 · 38 39 40
7245 1045 887 1 0672 .30500	*.0126 .0125 .0124 .0122 .0121	.034 .0 4 .034 .034 .034	542 552 561 571 580	.100 .100 .111 .170 .111	.370 .380 .390 .400 .410				41 42 43 44 45
1336 2186 2014 3912 4700	.0120 .0118 .0117 .0115 .0114	.034 .034 .034 .034 .034	589 583 607 616 624	.111 .111 .111 .111 .125	.420 .430 .415 .460 .475	1	 		46 47 48 49 50
5673 6575 7481 9397 9322	.0113 .0112 .0110 .0109 .0108	.034 .034 .034 .034 .034	632 640 617 655 662	.105 .105 .100 .100 .100	.495 .515 .540 .535 .50	·			51 52 53 54 55

(121)

CONTINUED.

56 546 .0098 .044 525 .0178 122	Per Cent.	Sulphuric Acid (H ₂ SO ₄)	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Nitric Acid (HNO ₃)	Dif. in Percent- age Cor- respond'g with Dif. in >p. Gr. of .0001	Mean Cor- rection for 1° F. above or below 59° F.	Hydro- chloric Acid (HCl).	Dif. in Percent- age t'or- respond'g with Dif. in Sp Gr. of. 0001.	Mean Cor- rection for 1° F, above or below 59° F,
58 758 0.096 0.044 688 0.187 1.32 60 984 0.095 0.44 688 0.187 1.32 61 5070 0.094 0.45 793 0.193 1.41 62 1.77 0.094 0.46 845 0.196 1.47 63 2.85 0.093 0.47 896 0.199 1.52 64 394 0.092 0.48 946 0.03 1.57 65 504 0.091 0.49 996 0.208 162 66 615 0.090 0.50 4045 0.213 187 67 727 0.089 0.51 0.94 0.218 172 68 839 0.089 0.52 143 0.224 177 68 839 0.089 0.55 274 0.024 182 70 6064 0.089 0.55 274 0.024 198										
59 858 0095 044 688 0187 182 60 964 0095 044 741 0190 136 61 5070 0094 045 793 0193 141 62 177 0094 046 845 0196 147 63 285 0093 047 896 0199 152 64 394 0092 048 946 003 157 65 504 0091 049 996 0208 162 67 727 0089 051 094 0218 177 68 839 0089 052 143 0224 177 69 952 0088 .053 190 0230 182 70 6064 0089 .055 274 0242 198 72 288 0089 .055 314 0249 199 78										
60 964 0095 044 741 0190 136										
61										
62 177 0094 0.46 845 0.0196 147 63 285 0.098 0.47 896 0.199 152 64 304 0.092 0.48 946 0.008 157 65 504 0.091 0.49 996 0.208 162 66 615 0.090 0.50 4045 0.218 172 68 839 0.089 0.51 0.94 0.218 172 68 839 0.089 0.52 143 0.224 177 69 952 0.088 0.53 190 0.230 182 70 6064 0.089 0.55 274 0.242 193 71 1.76 0.089 0.55 274 0.242 193 72 2.88 0.089 0.55 314 0.249 199 73 3.99 0.090 0.54 388 0.260 212 <td>Q1</td> <td>5070</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Q1	5070								
63 285 .0098 .047 896 .0199 .152 64 304 .0092 .048 946 .003 .157 65 504 .0091 .049 .996 .0208 .162 66 615 .0090 .050 .4045 .0218 .172 67 727 .0089 .051 .094 .0218 .172 68 839 .0089 .052 .143 .0224 .177 69 .952 .0088 .053 .190 .0230 .182 70 .6064 .0089 .054 .233 .0236 .187 71 .176 .0089 .055 .274 .0242 .198 72 .288 .0089 .055 .314 .0249 .199 78 .399 .090 .054 .388 .0260 .212 74 .511 .0089 .054 .388 .0265								•••••		
64 394 0092 048 946 0'03 157 65 504 0091 049 996 0208 162 66 615 0090 050 4045 0213 167 67 727 0089 051 094 0218 172 68 839 0089 052 143 0224 177 69 952 0088 053 190 0230 182 70 6064 0089 055 274 0242 198 71 176 0089 055 274 0242 198 72 288 0089 055 314 0249 199 78 399 0090 054 352 0255 205 74 511 0089 054 428 0260 212 75 623 0089 053 459 0273 228 77 <										• • • • • •
65 504 0091 .049 996 .0208 .162 66 615 .0090 .050 .4045 .0213 .167 67 .727 .0189 .051 .094 .0218 .172 68 .839 .0089 .052 .143 .0224 .177 69 .952 .0088 .053 .190 .0230 .182 70 .6064 .0089 .055 .274 .0242 .198 71 .176 .0089 .055 .274 .0249 .199 73 .389 .0089 .055 .314 .0249 .199 73 .389 .0090 .054 .388 .0260 .212 75 .623 .0089 .054 .388 .0260 .212 75 .623 .0089 .053 .459 .0273 .228 77 .846 .0089 .053 .459 .0273										
66 615 0090 050 4045 0213 167 67 727 0089 051 094 0218 172 68 839 0089 052 143 0224 177 69 952 0088 053 190 0230 182 70 6064 0089 055 274 0242 193 71 176 0089 055 274 0242 198 72 288 0080 055 314 0249 199 78 399 0090 054 388 0265 2205 74 511 0089 054 388 0260 212 75 623 0089 054 423 0265 220 76 734 0090 053 459 0273 228 77 846 0089 053 494 0274 236 78										
67 727 0089 051 094 0218 172 68 839 0089 052 143 0224 177 69 952 0088 053 190 0236 182 70 6064 0089 054 233 0236 187 71 176 0089 055 274 0242 198 72 288 0089 .055 314 .0249 199 78 399 .0090 .054 388 .0260 212 75 623 .0089 .054 428 .0265 220 76 734 .0090 .053 459 .0273 .228 77 846 .0089 .053 494 .0274 .336 78 957 .0090 .052 563 .0281 .261 79 .7068 .0090 .052 563 .0286 .273		•						•		
68 839 .0089 .052 143 .0224 .177 69 .952 .0088 .053 190 .0230 .182 70 .6064 .0089 .055 .274 .0242 .198 71 .176 .0089 .055 .314 .0249 .199 78 .399 .0090 .054 .382 .0255 .205 74 .511 .0089 .054 .388 .0260 .212 75 .623 .0089 .054 .488 .0265 .220 76 .734 .0090 .053 .459 .0273 .228 .77 .846 .0089 .053 .459 .0273 .228 .78 .957 .0090 .053 .494 .0274 .236 .78 .957 .0090 .052 .563 .0281 .261 .80 .179 .0090 .052 .597 .0284 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>· · · · · · · ·</td>										· · · · · · · ·
69 952 0088 053 190 0230 182 70 6064 0089 054 233 0236 187 71 176 0089 055 274 0242 199 72 288 0089 055 314 0249 199 78 399 0090 054 382 0255 205 74 511 0089 054 388 0260 212 75 623 0089 054 423 0265 220 76 734 0090 053 494 0274 236 77 846 0089 053 529 0278 254 79 7068 0090 052 563 0281 261 80 179 0090 052 567 0286 278								· • • • • · · ·	• • • • • • • •	· • • • • • •
70 6064 .0089 .054 .238 .0236 .187 71 176 .0089 .055 .274 .0242 .198 72 .288 .0089 .055 .314 .0249 .199 78 .399 .0090 .054 .388 .0260 .212 75 .623 .0089 .054 .488 .0260 .212 76 .734 .0090 .053 .459 .0273 .228 77 .446 .0089 .053 .494 .0274 .236 78 .957 .0090 .053 .494 .0274 .236 79 .7068 .0090 .052 .563 .0281 .261 80 .179 .0090 .052 .563 .0281 .261 81 .290 .0090 .052 .621 .0286 .273 82 .400 .0091 .053 .655 .0288								• • • • • •		· · · · · · ·
71 176 .0089 .055 274 .0242 .198 72 288 .0089 .055 314 .0249 .199 78 399 .0090 .054 .352 .0255 .205 74 .511 .0089 .054 .388 .0260 .212 75 .623 .0089 .054 .428 .0265 .220 76 .734 .0090 .053 .459 .0273 .228 77 .846 .0089 .053 .494 .0274 .236 78 .957 .0090 .052 .563 .0281 .261 79 .7068 .0090 .052 .563 .0281 .267 81 .290 .0090 .052 .597 .0284 .267 81 .290 .0090 .052 .621 .0286 .273 82 .400 .0091 .053 .655 .0288										
72 288 .0089 .055 314 .0249 .199 78 399 .0090 .054 .352 .0255 .205 74 511 .0089 .054 .388 .0260 .212 75 .623 .0089 .054 .428 .0265 .220 76 .734 .0090 .053 .459 .0273 .228 77 .846 .0089 .053 .494 .0274 .236 78 .957 .0090 .053 .529 .0278 .254 79 .7068 .0090 .052 .563 .0281 .267 81 .290 .0090 .052 .597 .0284 .267 81 .290 .0090 .052 .621 .0286 .273 82 .400 .0091 .053 .655 .0288 .276 83 .509 .0092 .054 .699 .0290						1			••••	
78 399 .0090 .054 352 .0255 .205 74 511 .0089 .054 388 .0260 .212 75 .623 .0089 .054 428 .0265 .220 76 .734 .0090 .053 459 .0273 .228 77 .846 .0089 .053 494 .0274 .236 78 .957 .0090 .053 529 .0278 .254 79 .7068 .0090 .052 .563 .0281 .261 80 .179 .0090 .052 .563 .0281 .267 81 .290 .0090 .052 .651 .0286 .273 82 .400 .0091 .052 .651 .0286 .276 83 .509 .0092 .054 .699 .0290 .279 84 .615 .0094 .056 .733 .0291									• • • • • • •	· • • • • • •
74 511 .0089 .054 388 .0260 .212 75 623 .0089 .054 428 .0265 .220 76 734 .0090 .053 459 .0273 .228 77 846 .0089 .053 529 .0278 .254 78 .957 .0090 .053 529 .0278 .254 79 .7068 .0090 .052 .563 .0281 .261 80 .179 .0090 .052 .597 .0284 .267 81 .290 .0090 .052 .621 .0286 .273 82 .400 .0091 .053 .655 .0288 .276 83 .509 .0092 .054 .699 .0290 .279 84 .615 .0094 .056 .733 .0291 .280 85 .718 .0097 <t.058< td=""> .767 .0291 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>· • • • · · ·</td><td>· · · · · · · ·</td><td></td></t<></t.058<>								· • • • · · ·	· · · · · · · ·	
75 623 .0089 .054 428 .0265 .220 76 734 .0090 .053 459 .0273 .228 77 846 .0089 .053 494 .0274 .236 78 .957 .0090 .053 .529 .0278 .254 79 .7068 .0090 .052 .563 .0281 .261 80 .179 .0090 .052 .597 .0284 .267 81 .290 .0090 .052 .621 .0286 .273 82 .400 .0091 .053 .655 .0288 .276 83 .509 .0092 .054 .699 .0290 .279 84 .615 .0094 .056 .733 .0291 .280 85 .718 .0097 .058 .767 .0291 .281 86 .818 .0105 .062 .835 .0290										
76 734 .0090 .058 459 .0273 .228 77 846 .0089 .053 494 .0274 .236 78 .957 .0090 .053 .529 .0278 .254 79 .7068 .0090 .052 .563 .0281 .261 80 .179 .0090 .052 .597 .0284 .267 81 .290 .0090 .052 .621 .0286 .273 82 .400 .0091 .053 .655 .0288 .276 83 .509 .0092 .054 .699 .0290 .279 84 .615 .0094 .056 .733 .0291 .280 85 .718 .0097 .058 .767 .0291 .281 86 .818 .0100 .060 .801 .0291 .282 87 .913 .0105 .062 .835 .0290										· · · · · · ·
77 846 0089 053 494 0274 236 78 957 0090 053 529 0278 254 79 7068 0090 052 563 0281 261 80 179 0090 052 597 0284 267 81 290 0090 052 621 0286 273 82 400 0091 053 655 0288 276 83 509 0092 054 699 0290 279 84 615 0094 056 733 0291 280 85 718 0097 058 767 0291 281 86 818 0100 060 801 0291 282 87 913 0105 062 835 0290 283 88 8003 0111 064 869 0288 284 89 <		020	.บบกม	.004	425	.0200				
78 957 .0090 .053 529 .0278 .254 79 .7068 .0090 .052 .563 .0281 .261 80 .179 .0090 .052 .597 .0284 .267 81 .290 .0090 .052 .621 .0286 .278 82 .400 .0091 .053 .655 .0288 .276 83 .509 .0092 .054 .699 .0290 .279 84 .615 .0094 .056 .733 .0291 .280 85 .718 .0097 .058 .767 .0291 .281 86 .818 .0100 <t>.060 .801 .0291 .282 87 .913 .0105 .062 .835 .0290 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286</t>										.
79 7068 .0090 .052 563 .0281 .261 80 179 .0090 .052 597 .0284 .267 81 .290 .0090 .052 621 .0286 .273 82 .400 .0091 .053 655 .0288 .276 83 .509 .0092 .054 .699 .0290 .279 84 .615 .0094 .056 .733 .0291 .280 85 .718 .0097 .058 .767 .0291 .281 86 .818 .0100 .060 .801 .0291 .282 87 .913 .0105 .062 .835 .0290 .283 88 .8003 .0111 .064 .869 .0286 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285										
80 179 .0090 .052 597 0284 .267 81 290 .0090 .052 621 .0286 .273 82 400 .0091 .053 655 .0288 .276 83 509 .0092 .054 .699 .0290 .279 84 615 .0094 .056 733 .0291 .280 85 718 .0097 .058 767 .0291 .281 86 818 .0100 .060 801 .0291 .282 87 913 .0105 .062 .835 .0290 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .363 .0250 .132 .044 .0240 .283 94 .335 .0313 .160 <								• • • • • • • •	· • • • • • •	· · · · · · · · · ·
81 290 0090 052 621 0286 273 82 400 0091 053 655 0288 276 83 509 0092 054 699 0290 279 84 615 0094 056 733 0291 280 85 718 0097 058 767 0291 281 86 818 0100 060 801 0290 283 87 913 0105 062 835 0290 283 88 8003 0111 064 869 0288 284 89 083 0125 066 903 0286 285 90 153 0143 076 938 0285 285 91 213 0167 088 973 0284 284 92 263 0200 106 5008 0283 284 93 <										
82 400 0091 .053 655 .0288 .276 83 509 .0092 .054 699 .0290 .279 84 615 .0094 .056 733 .0291 .280 85 718 .0097 .058 767 .0291 .281 86 818 .0100 .060 801 .0291 .282 87 913 .0105 .062 835 .0290 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>• • • • • • •</td><td>• • • • •</td><td>• • • • • •</td></td<>								• • • • • • •	• • • • •	• • • • • •
83 509 .0092 .054 699 .0290 .279 84 615 .0094 .056 733 .0291 .280 85 718 .0097 .058 767 .0291 .281 86 818 .0100 .060 801 .0291 .282 87 913 .0105 .062 835 .0290 .283 88 8003 .0111 .064 869 .0288 .284 89 .083 .0125 .066 903 .0286 .285 90 .153 .0143 .076 938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 .283 94 .335 .0313 .160 .080 .0278 .283 95 .362 .0370 .195 .116 .0276 .282 96 .384 .0455 .240 .152 .0273 .282 97 .395 .0909 .480								. 		
84 615 0094 .056 733 .0291 .280 85 718 .0097 .058 767 .0291 .281 86 818 .0100 .060 801 .0291 .282 87 .913 .0105 .062 .835 .0280 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 .283 94 .3335 .0313 .160 .080 .0278 .283 95 .362 .0370 .195 .116 .0276										
85 718 .0097 .058 767 .0291 .281 86 818 .0100 .060 801 .0291 .282 87 .918 .0105 .062 .835 .0290 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .363 .0250 .132 .044 .0280 .283 94 .335 .0313 .160 .080 .0278 .283 95 .362 .0370 .195 .116 .0276 .282 96 .384 .0455 .240 .152 .0273								· • • • • • • •	• • • • • • •	
86 818 .0100 .060 801 .0291 .282 87 913 .0105 .062 835 .0290 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 .283 94 .335 .0313 .160 .080 .0276 .283 95 .362 .0370 .195 .116 .0276 .282 96 .384 .0455 .240 .152 .0273 .282 97 .395 .0909 .480 .188 .0270 .281								· • • • • • •		· • · · • • • •
87 913 .0105 .062 835 .0290 .283 88 .8003 .0111 .064 .869 .0288 .284 89 .083 .0125 .066 .903 .0286 .285 90 .153 .0143 .076 .938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 .283 94 .335 .0313 .160 .080 .0276 .282 95 .362 .0370 .195 .116 .0276 .282 96 .384 .0455 .240 .152 .0273 .282 97 .395 .0909 .480 .188 .0270 .281	(36	118	.0097	.058	107	.0291	.281	· · • • • • · ·		
88 8003 .0111 .064 869 .0288 .284 89 .083 .0125 .066 903 .0286 .285 90 .153 .0143 .076 938 .0285 .285 91 .213 .0167 .088 .973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 .283 94 .335 .0313 .160 .080 .0278 .283 95 .362 .0370 .195 .116 .0276 .282 96 .384 .0455 .240 .152 .0273 .282 97 .395 .0909 .480 .188 .0270 .281										
89 083 .0125 .066 903 .0286 .285 90 · 153 .0143 .076 938 .0285 .285 91 213 .0167 .088 973 .0284 .284 92 .263 .0200 .106 .5008 .0283 .284 93 .303 .0250 .132 .044 .0280 .283 94 .335 .0313 .160 .080 .0278 .283 95 .362 .0370 .195 .116 .0276 .282 96 .384 .0455 .240 .152 .0273 .282 97 .395 .0909 .480 .188 .0270 .281										
90 153 .0143 .076 938 .0285 .285 91 213 .0167 .088 973 .0284 .284 92 263 .0200 .106 .5008 .0283 .284 93 303 .0250 .132 .044 .0280 .283 94 335 .0313 .160 .080 .0278 .283 95 362 .0370 .195 .116 .0276 .282 96 384 .0455 .240 .152 .0273 .282 97 395 .0909 .480 .188 .0270 .281								. .		
91 213 .0167 .088 973 .0284 .284 92 263 .0200 .106 .5008 .0283 .284 93 3.03 .0250 132 .044 .0280 .283 94 335 .0313 .160 .080 .0278 .283 95 362 .0370 .195 .116 .0276 .282 96 384 .0455 .240 .152 .0273 .282 97 395 .0909 .480 .188 .0270 .281										· • • · · · · ·
92 268 .0200 .106 .5008 .0283 .284 93 3.03 .0250 .132 .044 .0280 .283 94 3.35 .0313 .160 .080 .0278 .283 95 3.62 .0370 .195 .116 .0276 .282 96 3.84 .0455 .240 .152 .0273 .282 97 3.95 .0909 .480 .188 .0270 .281	80 -	153	.0143	.076	938	.0285	.285	· • • • • • •	· • • • • • • •	• • • • • • • • •
93 303 .0250 .132 044 .0280 .283 94 335 .0313 .160 080 .0278 .283 95 362 .0370 .195 116 .0276 .282 96 384 .0455 .240 152 .0273 .282 97 395 .0909 .480 188 .0270 .281	91	213	.0167				.284			
94 335 .0313 .160 .080 .0278 .283 95 362 .0370 .195 116 .0276 .282 96 384 .0455 .240 152 .0273 .282 97 395 .0909 .480 188 .0270 .281	92	263			.5008	.0283		. 		
95 362 .0370 ,195 116 .0276 .282								.		.
96 384 .0455 .240 152 .0273 .282								· · · · · · · · ·	· • • · · • • ·	
97 395 .0909 .480 188 .0270 .281	95	362	.0370	, 195	116	.0276	.282	· • • • • • •		
	96	384	.0455						[. 	
98 405 .2000 1.060 224 .0267 .280								<i>.</i>		
99 410 .2000 1.000 262 .0264 .279								· • • • • • •		
100 300 .0500 .255 300 .0260 .278	100	390	.0500	. 255	300	.0260	.278			

To convert per cent. of H2SO4 to per cent. of 808, multiply by .81688.

To convert per cent. of SO₃ to per, cent. of H₂SO₄, multiply by 1.225.

To convert per cent. of HNO₂ to per cent. of N₂O₅, multiply by .85714.

CONTINUED.

Phos- phoric Acid. (H ₂ PO ₄).	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Correction for 1° F. above or below 59° F.	Acetic Acid E02E302.	Dif. in Percent age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Ammonia (NH ₃).	Dif. in Percent- age Cor- respond'g with Dif. in Sp. Gr. of .0001.	Mean Cor- rection for 1° F. above or below 59° F.	Per Cent.
. 40257	0107	.035	669	.143	.615				56
1202	.0106	:035	675	.167	. 645	1			57
2155	.0105	.085	683	.148	.675				58
3120	.0104	.035	688	. 167	. 725				59
4095	.0108	.035	694	. 167	.775			•••••	60
5070	.0108	085	700	. 167	.825				61
6067	.0102	.035	706	. 167	.875		l.'		63
7064	.0101	.036	711	, .200	.920				63
8068	.0100	.036	716	. 200	. 960		. 		64
9090	.0099	085	721	.200	1.000		. 		65
.50100	.0098	.036	726	.200	1.000				66
1128	.0097	.037	730	.250	1.100				67
2164	.0096	.038	734	.250	1.150		l. .		68
3208	.0096	.038	733	. 250	1.200				69
4260	.0095	.039	743	.250	1.250		 .	• • • • • • • • • • • • • • • • • • •	70
5319	.0094	.039	746	.250	1.500	l			71
6385	.0093	.040	749	.333	2.000				72
7459	.0093	.010	751	.500	2.500				73
8540	.0092	.041	758	.500	3.000				74
9630	.0092	.041	755	.500	4.000		. 	. 	75
60727	.0091	.042	756	1.000	5.000				76
1933	.0091	.043	757	1.000	6.000				77
3044	.0090	.041	· 757	1.500	8.000				78
4164	.0089	.035	757	2.000	10.000				79
5289	.0089	.035	757	1.000	6.000				80
6420	.0088	.034	756	1.000	5.000				81
7558	.0088	.034	755	1.000	4.000				8
8706	.0087	.034	753	.500	3.000				83
9860	.0086	.033	751	.500	2 500			.	84
.71020	.0086	.083	748	. 333	2.000		· · · · · · ·		85
			745	. 333	1.750				86
	.		740	.200	1.500				87
			735	. 200	1.250				88
			729	. 167	1.000				89
			722	.143	.810			· · · · · · · · ·	90
			714	. 125	.720				91
	 - 		705	.111	.640				92
!			695	.100	.590				93
			683	.083	.500		· • · • • • •	· · · · · · · · ·	94
		· · · · · · · · · ·	669	.071	.420			• • • • • • • •	95
· · · · · · · · · ·			653	.063	.370				96
	·		631	.053	.300				97
!	·		613	.048	.275]	98
·····			589	.042	.250				99
					· • • • • • •				100

To convert per cent. of N_2O_8 to per cent. of HNO_8 , multiply by 1.1667. To convert per cent. of H_3PO_4 to per cent. of P_2O_6 , multiply by .7245. To convert per cent. of P_2O_8 to per cent. of H_3PO_4 , multiply by 1.3808.

- 26. What is the poisonous principle of loco-weed? Accepted by A. B. Stevens, Detroit.
- 27. Researches on any of the indigenous drugs are desired, especially those recently introduced. Accepted by J. Lamoreux, Lakeview.
- 28. To what extent is it preferable to weigh liquids-(1) in making preparations; (2) in dispensing?
 - 29. What is the best solvent for iodoform?
- 30. To what extent does the precipitated sulphur of the market contain a large proportion of sulphate of calcium? Accepted by A. Hall, Greenville.
- 31. Experimental determinations of the coefficient of expansion by heat of officinal liquids, particularly of solutions, dilute acid, etc., are desired. Accepted by A. B. Lyons, Detroit.
- 32. The vivid green color of certain solid and fluid extracts has been attributed to the presence of copper. To what copper compound, if any, is it really due, and how is this green color to be distinguished from chlorophyll?
- 33. A simple method of assaying crude ipecae is desired. Accepted by A. B. Lyons, Detroit.
- 34. Does the sulphurated lime of commerce come up to the requirements of the U. S. Ph., and how serviceable is the method of assay of the U. S. Ph.?
- 35. What merits have the so-called "concentrations" now largely manufactured in this country? Do they generally sustain the claims made for them?
- 36. Should the use of powdered extract in place of the ordinary solid extracts be encouraged?
- 37. What is the character of the powdered extracts of cannabis india offered by our manufacturing chemists? Accepted by N. Vanden Belt, Detroit.
- 38. An examination of the various pepsins in the market is desired, with a criticism of the U. S. Ph. method of assaying pepsins.
- 39. To what extent is the metric system now in use by physicians? Accepted by C. G. Stone, Detroit.
- 40. What names should be given to the compounds of hydrogen acids with alkaloids? Accepted by A. B. Lyons, Detroit.

Constitution and By-Laws.

ADOPTED AT LANSING NOVEMBER 15, 1883.

PREAMBLE.

WHEREAS, organization, concert of action, and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore

Resolved, That we, druggists of the State of Michigan, in convention assembled at Lansing, organize ourselves into such an association, and adopt the following Constitution and By-Laws:

ARTICLE L

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The objects of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard and ultimately to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer, and an Executive Committee of five members, all of whom shall be elected at the regular annual meeting of the Association, by ballot, and to serve until their successors are elected.

ARTICLE V.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, call special meetings at the written request of twenty-five members, shall present at each meeting a report of the Association and perform such other duties as pertain to the office.

SEC. 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election, also notify members of committees of their appointment and election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee.

SEC. 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury, when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.

SEG. 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.

SEC. 5. It shall be the duty of the Executive Committee to aid the local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.

This Association may establish for its future government and regulation such by-laws not in conflict with this constitution, as may be deemed proper and desirable.

ARTICLE VIII.

Every proposition to alter or amend this constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this constitution.

BY-LAWS.

ARTICLE I.

Twenty members shall constitute a quorum.

ARTICLE II.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmary, shall be presented to the Association in writing, signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee,

the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for election.

ARTICLE III.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary, and the applicant shall subscribe to the constitution and by-laws before the end of the next annual meeting.

ARTICLE IV.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.

- SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be an ex-officio member,) each to consist of three members, viz: Committee on Trade Interests, Committee on Pharmacy and Queries, Committee on Legislation.
- SEC. 2. Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.
- SEC. 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable to be reported upon at the next annual meeting.
 - SEC. 4. The Committee on Legislation shall keep a record of

and compile, for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.

Section 1. These by-laws shall not be suspended without the consent of two-thirds of the members present.

SEC. 2. Any amendment to these by-laws must be made in writing, and read before the Association, at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these by-laws.

ARTICLE VIII.

Five delegates and five alternates shall be annually elected to attend the meetings of the American Pharmaceutical Association. Also to attend the National Retail Druggists' Association.

ARTICLE IX.

The proceedings of the Association, the roll of officers, committees and members shall be published annually under the supervision of the Secretary and Executive Committee, and a copy of the proceedings sent to each member of the Association.

ARTICLE X.

Any member may be expelled for improper conduct or any officer removed from office, for violating the constitution or by-laws, but no person shall be expelled or removed except by a two-thirds vote of all the members present at a regular meeting, and after he shall have been given an opportunity to be heard in his own defense.

ARTICLE XI.

The Association invites manufacturers and others to exhibit at the annual meeting, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SEC. 2. The Order of Business shall be as follows:

- 1. Calling roll of members.
- 2. Reading of minutes of previous session.
- 3. Address of retiring President.
- 4. Applications for membership.
- 5. Election of members.
- 6. Reports of officers and committees.
- 7. Miscellaneous business.
- 8. Reading of communications.
- 9. Election of officers.



Roll of Members.

[Members are requested to report any inaccuracies in this list and notify the Secretary of any changes in addresses;]

Adams, Chas. H	Otsego	'84
Alsdorf, F. M	Lansing	' 83
Aldworth, F. G	Grand Rapids	'8 ₄
Alexander, A. P	Albion	"
Allen, A. W	Detroit	'83
Anderson, Ellery	Midland	' 84
Anderson, Mxaon	Midland	"
Andrus, W. S	Utica	'83
Andrews, S. N	Flint	'84
Arbour, Henry	Chippewa Lake	"
Arbour, M. T	Orangeville Mills	"
Atwater, Charles H	Lapeer	"
Banks, A. W	Detroit	'83
Bachman, M. H	Stanton	"
Bartram, E	Paw Paw	"
Baier, Charles G	Detroit	"
Bannard, H. F	Kalkaska	"
Baldwin, E. L	Tallman	'84
Baxter, Thomas A	Grand Rapids	"
Bassett, E. C	South Lyon	"
Bassett, Arthur	Detroit	"
Bauer, A. Christian	Grand Rapids	"
Barbour, F. S		"
Bahel, C. W	Otsego Lake	"
Babington, John	Corunna	"
Beebe, H	Eaton Rapids	'83
Bertram, I. P	Westphalia	"

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	Belsher, Wm. E	Saginaw	'84
	Bertram, Julius	Alpena	"
	Beachum, C. B	Romeo	"
~	Beach, Lyman T	Bay City	"
	Bennett, John R	Muskegon	"
	Bird, C. E	Saugatuck	66
	Bird, Henry, Jr	Douglas	"
	Bigelow, Wm. H	Owosso	"
	Bigelow, C. P	Grand Rapids	"
	Birge, W. E	Kalamazoo	"
	Bigg, A. H	Detroit	"
	Blackmer, H. A	Charlotte	"
		Jones	"
	Bower, Manley	Clarkston	'83
	Bolio, Oliver	Eaton Rapids	'84
	Brown, H. J	Ann Arbor	'83
	Brown, I. V	Galesburg	"
	Brown, J. J	Okemos	"
	Brooks, Chas. L	Saginaw	'84
	Briggs, J. W	Schoolcraft	'83
	Bridgeman, M. L	Menominee	'84
	Bristol, U. D	Lapeer	4,5
	Bristol, F. E	Lapeer	"
	Bullard, E. A	Vassar	'83
	Buchanan, B. F	Harrisville	"
	Burwell, R. G	Fort Gratiot	'84
	Bullock, Sid. V	Howard City	"
	Burdick, H. H	Bay City	"
_	Burroughs, C. S	Clinton	"
	Cady, G. Frank	Hart	'83
	Calkins, H. W	Detroit	"
	Carman, N. F	Lansing	"
	Caldwell, James W	Detroit	'84
	Carrier, Hubert	Bay City	"
	Cahalan, John C	Wyandotte	"
	Chamberlain, G. T	Hartford	'83
	Chamberlain, M	Horton	'84
	Champney, W. R	Detroit	'83

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	Dupont, Wm	Detroit	'83
	Eberbach, O	Ann Arbor	"
	Eckerman, Alexander	Muskegon	'84
,	Empey M. C	South Bay City	٠.
	Escott, E. B	Grand Rapids	"
	Escott, F. H	Grand Rapids	"
	Farrand, Jacob S	Detroit	"
	Fales, Ferris R	Vassar	"
_	Fellows, Clarence A	Big Rapids	"
	Fehlig, Jr., Henry J	Belleville	"
	Fincher, F. William	Pentwater	'83
	Fildew, Alfred S	St. Johns	'84
	Fink, Leon C	Detroit	"
	Forrest, G. W	Chase	'83
	Foster, Washington	West Branch	'84
	Fordham, Watson W	Elmira	66
	Foot, Wm. H	East Saginaw	"
	Fournier, Lucien	Detroit	"
	Francis, J. L	Ypsilant	'83
	Frizelle, Seymour F	Detroit	'84
	Frizelle, Cleveland L	Detroit	٠.
	Frank, II. A	Detroit	'83
	Fulton, Robert	Detroit	'84
	Fuqua, C. Broussais	Grand Rapids	"
	Gahan, Daniel J	Flint	".
	Gates, Theodore O	East Tawas	٠.
•	Gardner, A. R	Pottersville	"
	Gerow, J. E	McBride	'83
	Gebhard, Adolph E	Muskegon	"
	Gibbs, Northrup C	Big Rapids	'84
	Gill, Wm. J	Beacon	"
	Gladding, B. O	Constantine	'83
	Gleason, Elmer J	Richmond	'84
	Goodrich, L. C.	Kalkaska	'83
		Ann Arbor	10.
	Gover, Geo. H.	Mt. Pleasant Jasper	'84
	Goodsell, Arthur A	Hillsdale	"
_	Condition, Democratic		

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION	215.
Greene, A. L Ann Arbor	'83
Grunow, Oliver H Detroit	
Griffith, Will F Howell	
Gregory, A. W. C Albion	
Gundrum, George Ionia	
Harvey, Thomas Farmers	
Harvey, H. D Bangor	
Harvey, S. K Detroit	'84
Hamilton, C. W St. Charles	'83
Hale, H. G Nashville	"
Hawkins, Henry Detroit	44
Haller, John P Sault St. Marie	'84
Hamilton, Harry G East Saginaw	"
Harris, Douglas S Lansing	
Halsey, Lineas I Utica	
Hastings, Rodney A Sparta	
Hanlon, Amos Middleville	
Harwood, G. M Petoskey	
Hall, Wm. A Greenville	"
Hartz, Henry F Detroit	
Haan, Gilbert T Grand Rapids	"
Harrison, II. E Richmond	"
Harrison, Dwight A Kalamazoo	
Hallock, Dayton G Detroit	
Hall, John W Hudson	
Harper, John C Milan	"
Hendricks, F. II Stanton	'83
Hewett, L. E Lansing	
Herley, M. L East Saginaw	"
Herrington, J. A Belleville	'84
Herrington, Carey H Belleville	"
Hewitt, J. S	
Hessler, Will Rockford	"
Meimbach, S. J Constantine	
Heath, Fred Muskegon	
Hedges, Hiram C North Lansing	"
Hicks, W. H Morley	'83
Hickins, E. S Blanchard	66

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		Morley	'84
		Evart	"
		Muskegon	"
		Hastings	"
		Saginaw	"
		Detroit	66.
	Horner, D. A	Caro	"
	Hogguer, F. F. W	Detroit	٤.
	Hogle, James L	Farmington	"
	Humphrey, C. E	Jackson	'83 .
	Hullinger, James	Big Rapids	. "
	Hutchings, Wm		66
	Hunter, John E		46
	Hurd, Albert E	Davison Station	'84
		Detroit	"
		Marshall	'83
		Marshall	'84
		Marshall	"
		Detroit	'83
	Jesson, Jacob		"
•	Jefts, Willard	•	'84
	Jones, E. L	Battle Creek	'83
		Traverse City	'84
		Ann Arbor	"
		Detroit	"
	•	Detroit	"
	Joslen, Oliver C		"
_		Brighton	'83
	Kay, Wm. J		'84
		Saginaw	'83
	Kephart, Henry		"
	Kephart, Walter	1 0	'84
	-	Au Sable	"
	= :	Traverse City	٤.
	Kemink, Theo		"
	Kellogg, John H	East Saginaw	"
	Kenrick, E. H	Hillsdale	"
•	Kenyon, W. W	Howell	"

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION.	217
Kirkwood, C. H Ishpeming	'84
Kibbee, Austin D Custer	٠¢.
Kinmont, Bruce F Vandalia	**
Kimball, John L Crystal Falls	"
Kipp, Frank D Grand Rapids	46
Kotcher, Charles W Detroit	46
Latimer, Frank N Ludington	'8' ₃
Lacy, E. M Sault St. Marie	'8 ₄
Lambert, Benj. L Detroit	"
Latimer, Robert F Jackson	66
Lamoreux, John Lakeview	66
Lamoreux, Sarah A Lakeview	66
Laubengayer, Theo. A Owosso	£6 ·
Laubengayer, John F Owosso	"
Lane, I. D Sand Beach	66
Lee, Albert B Detroit	"
Leonard, H Muskegon	"
Lever, Henry Newaygo	"
Leuschner, Richard Detroit	66
Look, J. Q Lowell	'83
Lobdell, John H Flat Rock	'84
Long, Byron W Portland	"
Loomis, W. E Portland	"
Longwell, Edgar B Paw Paw	66
Lumbard, W. D Jackson	'83
Lyman, A. H Manistee	"
Lyons, A. B Detroit	'8 ₄
Mann, Albert Ann Arbor	'83
Mason, George B Saline	"
Maynard, T.C Gagetown	'8 ₄
Martin, Calvin L Elk Rapids	"
Mandigo, W. R Sherwood	66
MacKimmie, John A Detroit	"
Mayer, Franz W Sebawaing	"
Madill, Thomas East Saginaw	"
Martin, Henry Jackson	46
Martin, A. F Imlay City	"
McDonald, George Kalamazoo	'8 ₃

•

	McDonald, Daniel T	Calumet	'83
	McFarland, A	Detroit	"
	McFarland, Wm	Detroit	'84
	McDonald, David	Kalamazoo	"
	McMullen, G. H	Ionia	'83
	McQueen, E. F	Mt. Pleasant	'84
	McKenna, John D	Meridith	"
	Merrell, F. P	Hartford	'83
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	Newell, Cyrus P	Flushing	"
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	Parker, A.S.	Detroit	· '8 ₃
	Parker, G. T	Port Huron;	"
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	Raider, J. F. A	Newaygo	"
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	Reasner, Francis M	Jackson	"
. •	Riebe, Carl		'83
	Ripley, L. G	Montague	'84
	Ringler, Eugene		"
	Richard, Thomas H		"
		Williamstown	'83
	Robbins, J. J		"
	Ronnefeld Theo	Datusit	• •

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	Safford, O. P	Flint	"
	Sawyer, R. J	Menominee	"
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	Schumaker, A. B	Grand Ledge	"
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	Shaw, Sylvester B	Marlette	"
	Shaw, Bowman B	Clare	"
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	Smith, Fletcher	Saginaw	."
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Treat, A. B Adrian	"
Tubbes, C. C Chesaning	'83
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Vandecar, J. H North Branch	'83
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Woodward, M. G	Lake City	"
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	Hopkins Station	'84

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• The handsome badges worn during the meeting by the members were presented to them by Chas. Wright & Co.

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-OF THE-

MICHIGAN STATE

Pharmaceutical Association,

-HELD IN----

MERRILL HALL, DETROIT,

OCTOBER 13, 14 AND 15, 1885.

---ALSO THE-

CONSTITUTION AND BY-LAWS, ROLL OF MEMBERS, ETC.

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1885.

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COMMITTEE ON LIQUOR LICENSE.

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STANLEY E. PARKILL	,		•		-		-	Owosso.
GUY M. HARWOOD,		•		•		•		Petoskey.
COM	MITI	EE	ON	FOI	R M U	LAR	Y.	
A. B. Prescott,	•		•		-			- Ann Arbor.
A. B. Lyons,		-		•		•		Detroit.
O. EBERBACH,	•		-	,	-			- Ann Arbor.
F. G. Wurzburg,		•		•		•		Grand Rapids.
Frank Inglis, -	-		-		•		-	Detroit.
COMMITTEE ON	MIC	HIG	AN	SCH	100i	L OI	7 P	HARMACY.
A. B. Lyons,		-		•		-		- Detroit.
Frank Wells,	-		-		-		-	Lansing.
A. B. Stevens,		-		-		-		- Detroit.

Delegates.

DELEGATES TO AMERICAN PHARMACEUTICAL ASSOCIATION.

A. B. Prescott,		•		-		-			- Ann Arbor.
A. B. STEVENS, -			-		-			-	Detroit.
O. EBERBACH,	-					•			- Ann Arbor.
A. B. Lyons,			-		-		-		- Detroit.
H. J. Brown,				-	_			-	Ann Arbor.
,									
		A	LTE	RN.	A TES	S.	-i.	•	
GEORGE McDonald,			-		-		-	•	Kalamazoo.
WM. DUPONT, -				-					- Detroit.
C. P. PARKILL,		-			-			-	Owosso.
JAMES VERNOR, -			-		-		-		- Detroit.
J. C. MUELLER,				ì		-			Detroit.
,									
DELEGATES T	О	NA	TIO	NA I	L RE	TA	IL	DR	UGGISTS'
		A	SSO	CIA	TION	٧.			
A. W. ALLEN,	-		•		-		-		- Detroit.
Frank Inglis,			•			-		-	Detroit.
W. H. KEELER, -				-			-		Saginaw City.
E. F. PHILLIPS,					-			_	Armada.
A. McFarland, -					-		-		- Detroit.
,									
		A	LTE	ERN	ATE	S.			•
G. W. STRINGER,		-		-		-			- Detroit.
FRANK ESCOTT, -					-				Grand Rapids.
W. H. BIGELOW,		-		-			-		- Owosso.
E. T. WEBB,							-		Jackson.
O. B. DICKINSON,				_		_			Grand Haven

DELEGATE TO NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

ASSOCIATION.										
Frank Wells,		-	•	•	Lansing.					
		ALTERI	VATE.							
J. C. MUELLER,	-	-	-	•	Detroit.					
DELEGATES TO ILLINOIS STATE PHARMACEUTICAL ASSOCIATION.										
Jacob Jesson,		-	-	•	Muskegon.					
HENRY KEPHART,		-	-	- Bern	rien Springs.					
A. H. LYMAN,	•	-	-	-	Manistee.					
DELEGATES TO INDIANA STATE PHARMACEUTICAL ASSOCIATION.										
GEORGE GUNDRUM,	-	-			Ionia.					
G. L. DAVIS,	-		-	-	Lansing.					
C. P. PARKILL,	-	-	-	-	Owosso.					
DELEGATES TO OHIO STATE PHARMACEUTICAL ASSOCIATION.										
FRANK INGLIS, -	•	-	-	•	Detroit.					
A. W. ALLEN,	•	•	-	•	Detroit.					
C. A. Fellows,				•	Big Rapids.					
DELEGATES TO WISCONSIN STATE PHARMACEUTICAL ASSOCIATION.										
J. L. Kellogg,		-	•	- Es	st Saginaw.					
O. P. SAFFORD,			-	-	Flint.					
Frank Hibbard,	-	-	-	•	- Evart.					

MICHIGAN BOARD OF PHARMACY.

APPOINTED BY HIS EXCELLENCY,

GOVERNOR RUSSELL A. ALGER,

JUNE 12, 1885.

ORGANIZED AT LANSING, JULY 7, 1885.

GEORGE McDonald,	-		-		•	Kalamazoo.
FLORENTIN H. J. VAN E	MSTER,			-		- Bay City.
JACOB JESSON, -	•		-		-	Muskegon.
JAMES VERNOR, -		-		-		- Detroit.
OTTMAR EBERBACH,	-		- '		-	Ann Arbor.

Officers of the Board.

PRESIDENT

OTTMAR EBERBACH, TREASURER JAMES VERNOR, SECRETARY. JACOB JESSON, MEETINGS.

The regular meetings of the Board are held on the first Tuesday of March, July and November. Special meetings at the call of the Board.

Compressed Tablets.

The Detroit druggists are royal entertainers.

One hundred and twenty-one of the members in attendance this year were at the meeting held in Detroit one year ago.

The beautiful silver tea set given Mr. Allen by the exhibitors, was a very graceful compliment as well as a just reward for his services.

Secretary Jacob Jesson has worked faithfully for the Association, and retires from the office with "his blushing honors thick upon him," having been dubbed "The Father of the Association."

"President Crouter presided with dignity and discretion, and has the satisfaction of knowing that his efforts in behalf of the Association and the Pharmacy law, are appreciated in their true worth by every member."

The entertainment furnished by the Detroit druggists, was one of the most pleasant features of the meeting. The play at the Detroit Opera House was attended by nearly every member in the city, most of whom went to the reception following at Merrill Hall, where, with feasting and dancing, all who could be, were made happy. Those of the boys who were Extra Dry on that occasion will please keep Mumm about it.

The next annual meeting will be held in Grand Rapids, the second Tuesday in October, 1886. Grand Rapids is a lively town and her merchants are noted for their hospitality; let every member make an effort to attend next year.

Members in Attendance

-AT THE---

THIRD ANNUAL MEETING,

HELD IN DETROIT,

OCTOBER 13, 14 AND 15, 1885.

A

Akey, J. V., Colon, Allen, A. W., Detroit. Anderson, E., Midland.

Baier, C. G., Detroit. Baker, Wm. H., Whitehall. Banks, A. W., Detroit. Bassett, A., Detroit. Bassett, E. C., South Lyon.
Bassett, J. A., Detroit.
Bence, G. W., Detroit,
Bennett, L. T. E., Port Huron.
Bullard, E. A., Vassar. Bessac, H. B., Milan. Bigelow, W. H., Owosso.

Caldwell, J. W., Detroit. Carney, M. S., Decatur. Church, H. M., Holly. Chamberlain, M., Horton. Champney, W. R., Detroit. Clark, J. R., Blissfield. Cleland, H., Detroit. Coffin, C. L., Detroit.

Andrus, C. S., Detroit. Andrus, W. S., Utica.

В

Blackmar, H. A., Charlotte. Bower, M., Clarkston. Brown, H. J., Ann Arbor. Brown, J. J., Okemos. Browning, G. B., Decatur. Bruske, R., East Saginaw. Buchanan, B. F., Harrisville. Burrows, C. S., Clinton.

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Cole, W. W., Morenci. Cooper, D. M., Detroit. Cushman, H. D., Three Rivers. Crouter, G. W., Charlevoix. Crawford, J. B. Ithaca. Crowley, J. J., Detroit. Currie, A. A., St. Clair. Curtis, F. E. Napoleon.

Damon, J. A., Millington. Davis, J. E., Detroit. Davis, Fred. S., Ypsilanti. Dickinson, O. B., Grand Haven.Dupont, Wm., Detroit. Dodds, W. H., Detroit.

Dodds, J. J., Detroit. Dunbar, R. H., Parma. Dunn, G. B., Burr Oak.

Eberbach, O., Ann Arbor. Emster, F. H. J. van, Bay City.

Escott, F. H., Grand Rapids.

Farrand, J. S., Detroit. Fasquelle, L. J., Ann Arbor. Fatin, C. A., Almont. Foster, W., West Branch.

Gardner, A. R., Fowlerville. Garrigues, S. S., Ann Arbor. Gladding, B. O., Constantine. Gleason, E., Richmond. Goodyear, J. J., Ann Arbor. Goodyear, W. H., Hastings.

Haan, G. T., Grand Rapids. Hallock, D. G., Detroit. Halsey, L. I., Útica. Harrison, D. A., Kalamazoo. Harris, D. S., Ypsilanti. Harvey, S. K., Detroit. Harwood, G. H., Petoskey. Hastings, R. A., Sparta. Hewett, J. S., Milford. Hibbard, F., Evart. Holt, A. E., Detroit. Hamlen, R. J., Detroit.

Inglis, F., Detroit.

Jesson, J., Muskegon. Johnson, O. C., Ann Arbor. Johnston, W., Detroit.

Kay, G. A. Detroit. Keeler, W. H., Saginaw. Kellogg, J. H., East Saginaw. Kellogg, J. L., East Saginaw.

Francis, J. L., Ypsilanti. Frank, H. A., Detroit. Fulton, Robert, Detroit. Fuqua, C. B., Big Rapids. Grandy, F., Fairfield. Graydon, G. H., Detroit. Griffith, W. F., Howell. Grunow, O. H., Detroit. Gundrum, Geo., Ionia.

н Harper, J. C., Milan. Harrison, H. E., Richmond. Hotchkiss. F., Hastings. Houp, F., Detroit. Hower, N., Mendon. Humphrey, C. E., Jackson. Hurd, C. W., Davison. Hurd, J. E., Detroit. Hutchings, W., Leslie. Hutton, B. J., Detroit. Hyde, H. J., Marshall.

Ι

J

Jones, E. L., Battle Creek. Judson, F. E., Brighton.

K Kenedy, E. J., Detroit. Kephard, H., Berrien Springs. Koon, C. S., Lisbon. Kotcher, C. W., Detroit. Lacy, E. M., Sault Ste. Marie. Lambert, B. L.; Detroit. Locher, H. E., Gra La Rue, C. M., West Bay City.Long, G. L., Flint. Laubengayer, T. A., Owosso. Lee, A. B., Detroit. Lee, John, Dexter. Lentz, Theo., Detroit.

Madill, T., East Saginaw. Mandigo, W. R., Sherwood. Martin, A. F., Imlay City. Marr, T. W., Detroit. Mason, C. A., Flint. Mason, G. B., Saline. Merrill, M. C., Webberville. Meyer, J., Mt. Clemens. Millikin, T. J., St. Clair. Mills, J. B., Dexter.

Nelson, E. H., Detroit.

McDonald, G., Kalamazoo.

Orr, J. J., Tecumseh.

Parker, A. S., Detroit. Parkill, C.P., Owosso. Parkill, S. E., Owosso. Patterson, B. M., Detroit. Pease, J. F., Detroit. Peacock, C. M., Corunna. Pegg, H. D., Morenci. Perry, D. B., West Bay City. Perry, F. W. R., Detroit. Petrie, J. D., Kalamazoo.

Ray, G. C., West Bay City. Reasner, F. M., Jackson. Reidy, M., Corunna. Richards, T. H., Detroit. Richardson, G., Ithaca.

L Litchfield, E. C., Flint. Locher, H. E., Grand Rapids. Longwell, H. D., Paw Paw. Lonsbury, P. M., Reed City. Lyons, A. B., Detroit.

M

McFarland, A., Detroit. McFarland, W., Detroit. McLean, Jackson. Moore, M. C., Albion. Moorland, C., Hadley.
Morford, A. D., Ypsilanti.
Morrison, A. W., Constantine.
Morrison, Thos., Wayne.
Mottram, J. H. H., Detroit. Mueller, J. C., Detroit.

N

Newell, C. P., Flushing.

Osborn, W. E., Grand Rapids. P

Phillips, E. F., Armada. Pinckney, C. A., Plymouth. Pinkerton, R. J., Bancroft. Pitcher, S., Detroit. Prall, D. E., East Saginaw. Pratt, G. A., Detroit. Prescott, A. B., Ann Arbor. Prittie, W. H., Detroit. Purvis, G. A., Detroit.

 \mathbf{R}

Ripley, L. G., Montague. Ronnefield, T., Detroit. Ross, E. W., Detroit. Roys, H. M., Farwell. Ruchty, L., Detroit.

S

Safford, O. P., Flint. Saltzer, A. B., Detroit. Shafer, W., Carleton. Schimmel, G. R., Detroit. Schumaker, A. B., Grand Ledge, Stevens, A. B., Detroit. Seed, A. W., Cass City. Stevens, F. D., Detroit. Sherman, H. B., Marshall. Stone, C. G., Detroit. Schlieper, F. A., Bay City. Short, W. E., Manistee. Sigler, F. A., Pinckney. Sloan, E. E., Corunna.

Taylor, C. W., Loomis. Taylor, E. J., Vassar. Tibbitts, A. H., Port Huron. Smith, C. M., Clarkston. Smith, Frank, Ypsilanti. Smith, Fred. D., Detroit, Sorg, H. A., Kalamazoo. Sprague, W. G., Flushing. Stringer, G. W., Detroit. Sweet, B. F., Carson City. Swift, Geo., Detroit.

т

Ticknor, G., Wyandotte. Tredwell, J. H., Detroit.

Vandecar, J. H., North Branch. Vernor, J., Detroit. Vanden Belt, N., Detroit.

 \mathbf{w}

Wallace, A. L., St. Johns. Waples, G. W., Detroit. Ward, G. J., St. Clair. Webb, E. T., Jackson. Webber, A. H., Big Rapids. Weise, H. S., Detroit. Wells, F., Lansing. Wells, L. B., Pontiac. Wheat, J. H., St. Johns. Whelpley, B. I., Hoytville. White, W. L., Grand Rapids. Whipple, G. N., Detroit.

Wiesinger, J. G., Detroit. Wilkins, F. C., Union City. Wilkinson, J. L., Bay City. Williams, H. M., Mason. Williams, M. C., Detroit. Williamson, G. E., Vassar. Williamson, J., Détroit. Wilson, W. A., St. Johns. Wrampelmeier, T. J., Ann Arbor. Wright, Chas., Detroit. Wright, E. A., Pentwater. Wurzburg, F. J., Grand Rapids.

Young, E. A., Mt. Clemens.

Proposed Amendment to the Constitution.

ARTICLE V. SECTION I.

To insert in line three after the word Association, these words:

Until the close of such meeting.

Section as amended would read as follows:

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association until the close of such meeting, call special meetings at the written request of twenty-five members, shall present at each meeting a report of the Association and perform such other duties as pertain to the office.

MINUTES

-OF THE-

THIRD ANNUAL MEETING

---OF THE---

MICHIGAN STATE

PHARMACEUTICAL ASSOCIATION.

FIRST SESSION,

TUESDAY AFTERNOON, OCTOBER 13, 1885.

The Association met in Merrill Hall, Detroit, at 2:30 o'clock, p. m., and was called to order by the President, G. W. Crouter, of Charlevoix, who said:

The Association will please come to order. The time has now arrived to open this, the Third Annual Session of the Michigan State Pharmaceutical Association. It gives me pleasure to congratulate the Association on the presence of so many of its members. I am indeed happy to welcome the new faces before me of many of our brothers who have not met with us in former meetings of the Association, but who are here to-day to aid us in elevating our profession. Iam also pleased to welcome the ladies, and I trust we may be honored by their presence at our meetings. The pleasant and profitable meeting in this hall a year ago is fresh in our memories, as we are met to-day by the same smiling faces, outstretched hands and expressions of good fellowship that greeted us then, all of which betoken the right royal welcome the Association will receive.

I have much pleasure in introducing to you the Rt. Rev. Bishop Harris, who will open our session with prayer.

Prayer by the Rt. Rev. Bishop Harris.

THE PRESIDENT: I will state to the association that in the absence of Gov. Alger, who has been called from the city on business, the Hon. T. H. Hinchman will welcome you in his stead. I take great pleasure in introducing to you Mr. T. H. Hinchman, of Detroit.

ADDRESS OF MR. T. H. HINCHMAN, OF DETROIT.

GENTLEMEN AND LADIES:—It must be known to you that I appear before you on very short notice. About half past ten this morning a committee called upon me and informed me that I was expected to address you on this occasion. Perhaps it may be more appropriate than if you had Gov. Alger to welcome you. As far back as the year 1830, I became a druggist. In that year I put up prescriptions, and never have made a mistake that I know of, except when I put up ten grains of calomel instead of one, and had a blowing up from the doctor for it. I am pleased to see so many of you assembled; there is but one regret, and that is, that so few outside of those from the city of Detroit are known to me. I have done business in this city singe 1836, and for a number of years knew every druggist in this State, especially as there were but few who for fifteen or twenty years after that time were doing an exclusive drug business. Then the sale of medicines was merged in a general business or with some other branch of trade. I am pleased to see so many intelligent looking young men here. I imagine they are all from the schools of Pharmacy and Chemistry at Ann Arbor, and perhaps I can also include the ladies who are here present. There is no reason why they should not be educated druggists and pharmacists.

I am much pleased as a citizen and representative of the trade to welcome the Pharmacists of Michigan to Detroit—a very old city, but one that has been rather famous for the good standing and stability of its merchants. The time has been when Detroit sold goods to Chicago and Milwaukee, and had some pretty hard customers there who did not pay their bills promptly. Eventually Chicago and Milwaukee not only shut us off from trade west of them, but have encroached largely upon our state trade, not at all to the credit of our Michigan dealers.

I presume that many of you are well acquainted with Detroit; there are no doubt others from the western part of the state who know little of it, and but few of its merchants, who prefer to go to the great city of Chicago where there are so many attractions and so many people, to make their purchases. This is not patriotic at least, and there cannot be adequate reasons for it. I speak

A FEW SENSIBLE REASONS

Frederick Stearns & Co.,

DETROIT. MICH. Can Prepare and Put Up for the Retail Druggist and Pharmacist His Private and Special Formulas Better, More Elegantly and Cheaper than he can do so Himself.

FIRST.—They import and buy their Drugs and Materials in very large quantities from first hands only, thereby securing THE CHOICEST SELECTIONS.

SECOND.—They carry in stock an IMMENSE VARIETY of Drugs,

THE CO

Chemicals, rare Alkaloids, etc., etc., and therefore can fill any want.
THIRD.—They powder and grind all their own Drugs, and can therefore GUARANTEE their purity.
FOURTH.—Their glass stock is enormous in quantity and variety, therefore almost ANY SIZE, SHAPE OR STYLE of bottle is on hand to

FIFTH.—They design and execute all the wrappers, labels, circulars, pamphlets, etc., used; therefore they can FURNISH SPECIAL WRAPPERS, circulars, labels, etc., in any style desired, and in the latest and most attractive designs, whether on stone, metal or wood, either plain or in colors.

SIXTH.—They MANUFACTURE THEIR OWN PAPER BOXES, and

can meet any style desired.

SEVENTH.—They manufacture ALL LINES of Pharmaceutical Preparations, as fluid and solid extracts, resinoids, suppositories, etc., etc., and

can therefore CERTIFY to their quality.

EIGHTH.—Their Sugar, Gelatine and Compressed Pill Departments are SURPASSED BY NONE, in completeness of equipment, and they can therefore furnish Pills of any shape, style of coating or size at shortest

NINTH -Their different special departments and machinery for preparing Liquids (as Syrups, Bitters, etc.), Ointments, Suppositories, Lozenges, Perfumes, etc., etc., are most complete, therefore ANY KIND of Special Work can be undertaken.

TENTH.—All special work is supervised by COMPETENT CHEMISTS,

University graduates, thus securing accuracy of preparation. ELEVENTH. - They SUBMIT PROOFS of wrappers in colors for approv-

al after quotation is accepted. TWELFTH.—They do the LARGEST business of this kind in America.

Send them your formulas for quotations, which cost nothing and are kept as strictly confidential.

UNIVERSITY OF MICHIGAN.

SCHOOL OF PHARMACY.

A two years' Graded Course. Daily Lectures, Recitations and practical work in the Laboratory.

Training for DISPENSING PHARMACY, AN-ALYTICAL and MANUFACTURING CHEMIS-TRY. Work in Pharmaceutical preparations; Qualitative and Quantitative Analysis; Proximate Organic Analysis; Assay of Drugs; Examination of Foods; Analysis of Water; Toxicology; Analysis of Urine; Microscopal Examination of Drugs, etc. Sraduates receive the Degree, PHARMACEUTICAL CHEMIST.

ADMISSION.—(1) Fraduates of Standard High Schools admitted WITHOUT examination.

- (2.)—Fersons over nineteen years of age and who have had two years' experience in the practice of Pharmacy, may be admitted without examination, but are required to pass the regular entrance examination before graduating.
 - (3)==Others are required to pass an Entrance Examination.

FEES. -- For residents of Michigan, \$35.00 for the first year, and \$25.00 each year thereafter. For non-residents of Michigan, \$60.00 for the first year and \$35.00 for each year thereafter. Students pay for the material and apparatus they use.

The Annual Announcement, giving full particulars, will be sent upon application to

THE DEAN,
School of Pharmacy,
ANN ARBOR, MICH.

what I know when I say that Detroit is one of the cheapest drug markets in the United States. There is no place where supplies

can be had so low on the average.

Detroit is a pleasant city, and many from the interior who have made money come here to settle. It may be that some of you gentlemen from the western part of the state, when you get rich, will come here to spend your money. It is considered a healthy city. There are about sixty retailers here, some of whom at times may be employed in selling proprietary medicines that do their customers no good, and in furnishing to the ladies cosmetics that they do not need. The legitimate requirements of the drug trade, I presume, would be light, if not supplemented by country trade. There are a good many doctors, also. They have their conventions and meetings. Some of them make many prescriptions and others less, and I have no doubt many prescriptions are made of inert simples when potent remedies are not needed.

I am pleased to know, gentlemen, that you have associated vourselves together for the advancement of your business interests and personal good. I am satisfied that you will derive great benefit from it. All persons, especially those handling medicines, should be thoroughly educated in their calling. It is now some ten or twelve years since an effort was made to get a bill through the legislature for regulating the sale of medicines, and not until the last session were you successful. Eight years ago I was in an official position, and then received many letters from druggists who were thoroughly opposed to the bill for the reason that they themselves were not educated, and thought it would be impossible to procure clerks who were. Thanks to the efforts of friends, and the influence of Ann Arbor schools, you have at length succeeded, and it is expected that hereafter every one in the business who undertakes to prepare prescriptions will be fully competent. If mistakes are made they certainly should not be those of ignorance. Gentlemen, I hope that your meeting will be entirely pleasant and profitable, and that you will not fail while here to renew an acquaintance with or make the acquaintance of those who are trying to do a wholesale drug business in this city.

THE PRESIDENT: Ex-President Wells, of Lansing, will answer for the Association to the very pleasant address we have just listened to.

RESPONSE BY MR. WELLS, OF LANSING.

In behalf of the Michigan State Pharmaceutical Association I thank you, Mr. Hinchman, for the cordial welcome to Detroit vou have so kindly extended to us. An added grace seems to attach to this welcome, coming as it does from perhaps the oldest pharmacist in Michigan. We meet to-day, not alone as a

society of business men, to consult together concerning the best means for promoting business interests; though these interests very properly receive a large share of our attention, there are others which command serious consideration from us as pharmacists. A chief bond of our union is, to foster those professional characteristics which distinguish our calling from that of any other class of merchants. These characteristics are daily making pharmacy more a science and less a mere business. Our annual meetings are our harvests, at which times are garnered for the general good the gleanings of laborers in many fields. The Association you welcome to-day, began its existence less than two years ago, but during that period it has accomplished results which may well excite the pride of its members. Beginning with less than one hundred and fifty members, it reached nearly five hundred the first year, and this number bids fair to be increased to seven hundred before the close of our present But it is distinguished not alone for this remarkable growth. Its efforts have been successful in securing a law restricting the practice of pharmacy to competent hands, thereby elevating its own character and furnishing to the people the best possible protection from the effects of incompetency, These are some of the results which testify to the spirit and zeal of Michigan pharmacists. This spirit and zeal bring us here to-day. We come from every portion of that great state of which this beautiful city is the metropolis and the pride. We come most willingly, for we have before tasted your hospitality and know its flavor. Those grand inland seas whose bending shores outline our homes, contract their vast expanse and their waters gradually converge to form the river upon whose banks rests this fair city. Here, like these waters, do we gather, and like them do we leave behind the storms and tides which fret and vex us; and, as their now placid waves murmur a response to a welcome they cannot feel, we, for our welcome, feel a response we cannot express.

THE PRESIDENT: The Secretary will now call the roll to ascertain if there is a quorum present.

Mr. JESSON, of Muskegon: I very much desire to have that order of business dispensed with, as the list is a very long one and will consume considerable time.

Mr. Wells, of Lansing: I move that the calling of the roll be dispensed with.

Carried.

THE PRESIDENT: The next order of business is the reading of the minutes of the last meeting.

Mr. Jesson: As a printed copy of the proceedings has been in the hands of members for months, I move that the reading be dispensed with.

Carried.

The President then delivered his address as follows:

PRESIDENT'S ADDRESS.

Gentlemen of the Michigan State Pharmaceutical Association:—

The remarks and suggestions I have to make on this occasion

will occupy your valuable time but a few minutes.

I desire to tender my hearty congratulations upon the auspicious circumstances under which this association meets this year. When, two years ago, a comparatively few earnest men met at Lansing and determined upon organizing a State Pharmaceutical Association, their most sanguine expectations fell far short of the magnificent success of this society, and the brilliant achievement so soon to be recorded in the statute books of the state.

For years a state pharmacy law was thought of only as a dim possibility. The futile efforts made by our lamented namesake and predecessor in former years, only served to make the prospect of success more shadowy and remote. But there came a time when the druggists of Michigan were aroused from their Organization had secured legislation in many other states; Michigan was being made the receptacle for the sweepings of her more fortunate neighbors; pharmacy was being degraded by the contact; education without regulative legislation was esteemed as good enough for visionary enthusiasts, but hardly worth the serious attention of a practical man of business; professional competency was also a very desirable thing, but it was regarded as too expensive a luxury for busy money-making druggists, who found that it rarely yielded a satisfactory cash equivalent. The situation excited the apprehensions of all interested in the welfare of pharmacy in Michigan. Our beloved state, they declared, shall not be the refuge of the charlatans and incompetents of other states; Michigan must maintain her high educational rank in the array of states, and pharmacy shall be honored with the dignity of legal recognition and protection. The forces of progress were duly martialed, and after a stubbornly contested fight in the Legislature, the victory was won by the enactment of a law which for completeness, strength and efficiency will, we believe, be found to be without an equal in the country. Though the bill passed through a tremendous fire. but a single section was materially injured, and this section, although it permits great latitude to general dealers in the sale

of certain drugs, is emphatic against any person calling himself a pharmacist or dispensing a prescription, unless he be actually registered. This is the essence of the legislation demanded, and with it the law cannot be regarded otherwise than as a triumph for progressive pharmacy. Messrs. Brown, Wells, Jesson, McDonald, Alsdolf, Gundrum, Davis and Engelhard, representing the druggists of Michigan at the capital, were an army in themselves, and are entitled to much praise for their eminent services. To his excellency, Governor Alger, to Lieutenant Governor Buttars, to Senator Huston, Speaker Clark, Representatives Ford, of Grand Rapids, Bardwell, of Plainwell, Collins, of Detroit, Wilson, of Muskegon and Dr. Shorts of Mason, we also owe a debt of gratitude for their unfailing counsel, encouragement and support.

A small cloud appeared on the horizon soon after the passage of the act. Though the State Board of Pharmacy is specifically directed to report annually to the Michigan State Pharmaceutical Association, the condition of pharmacy in the state, this provision will probably have to lie in abeyance until the next session of the Legislature, owing to the fact that the association cannot be incorporated under the general law, a special act being necessary. Under the circumstances, I would recommend that proper measures be taken at the earliest practicable day to give

the Association a legal existence by incorporation.

The inconvenience incident to conforming to the latter part of article three of the by-laws of this Association, requiring that applicants for membership "shall subscribe to the constitution and by-laws before the end of the next meeting," has tended to repel such applications, as this requirement is at the best perfunctory and useless. I would recommend that it be stricken out, leaving the article to read simply, "The initiation fee shall be one dollar, which shall be paid to the Secretary." The value of an interchange of fraternal greetings, of thought and experience, between the various state associations, especially those related to each other as neighbors, requires no argument. Nothing so tends to develop thought, to stimulate emulation of what is wise and beneficial and to strengthen the profession and trade with unity of purpose and action, as an extensive experience which looks beyond mere local confines and takes account of what outside localities are saying and doing for the promotion of the common good. The wisdom, therefore, of sending delegates from this Association to other state associations, and particularly to those of Wisconsin, Illinois, Ohio and Indiana, needed but a suggestion to meet my unqualified approval, and I therefore recommend that such delegates be appointed.

The apprenticeship system, or rather the want of any system, for the selection of those who enter the business young, has the greatest bearing upon the prospective elevation of pharmacy in

a professional sense. In those countries in the old world where a regular system has been adopted, we find the professional status of pharmacy of a correspondingly high order. In the United States, and more especially in states like our own, where pharmacy laws have been only recently enacted, the selection of apprentices has been as a rule governed entirely by circumstances, and the qualifications of the applicant are rarely taken into consideration. That this is a grievous error is apparent to any one having the best interests of the profession at heart. While we know that in all branches of trade and purely commercial pursuits, young men with the most meagre education have frequently attained greater success than those who have enjoyed the best of collegiate training, yet pharmacy is of that semi-professional character which makes demands upon both business capacity and educational attainments, and in the degree that these are properly combined, will success beachieved. Only those who early in life have been denied the advantages of a good education, and who afterwards have realized their shortcomings can form an adequate idea of the many difficulties with which this class have to contend. In pharmacy, comprising so many branches of science, a general understanding of which, at least, is necessary, those not qualified or trained to become interested in such knowledge, soon lose all interest in the business, as a profession, until they come to regard it as a mere mercantile undertaking and frequently through various expedients similar to those in other trades, namely, selling cheap goods, cutting in prices, etc., attempt to make a financial success, where from a professional standpoint they are a failure. Such is, in short, the history of many who have entered pharmacy as a business. Real and substantial advances can only be made when greater care is bestowed upon the selection of those who themselves are not in a condition to judge whether they be qualified I would therefore recommend that this Association and its members individually as far as practicable endeavor to carefully discriminate in selecting young men to learn the business—that only such persons as have enjoyed the advantages of at least a common school education be admitted—that persons who have studied the higher branches, including Latin, so essential in the study of Pharmacy, be given the preference in the employment of apprentices. In a great many instances young persons engaged in pharmacy, spend the few years of their apprenticeship without commencing any study in a systematic manner. Having leisure time, they arrive at the conclusion that when their time is up they will attend a school of pharmacy and that then they will commence study in earnest. Thus three or four years, usually the most valuable of a life time, pass away without any special advancement. Aside from the direct influence this inert period exercises on a young mind, in general, it also indirectly prevents

him from deriving the greatest possible benefits from the instruc tion when he finally enters a school of pharmacy. There, during the first term or more, he is compelled to devote his entire time to studies he should have learned in the store, and as a consequence, in the necessarily limited time allotted to the full course, the more advanced studies are more or less neglected. Studying in the store during spare hours, in the evening, etc., should therefore be encouraged, and it is recommended that employers lend them help, and afford all possible instructions to their clerks. It is also believed that any moderate expenditure employers may go to in providing works on pharmacy, will be appreciated, and that like bread cast upon the waters, it will come back to them ten-fold. It is with considerable pride that we can point to an institution in our own State, which in thoroughness of instruction, and in the high character of its faculty, compares advantageously with much older institutions. The School of Pharmacy of our State University at Ann Arbor was the first institution for teaching pharmacy which required an entrance examination. Any recommendation from me to the pharmacists of this state concerning the school of pharmacy would be entirely unnecessary, but I hope that it will be the ambition of all young persons engaged in pharmacy in the state, to avail themselves of the advantages afforded by this institution. In this connection, I desire to call the attention of those, who, from various circumstances, are unable to take a course in this school to the possibility of self-instruction at home. The ordinary text books. dispensatories, etc., not being suitable for systematic study, a course of instruction by printed lectures, and mailed to subscribers, and alternating with written recitations embracing various branches of the science of pharmacy, is being presented with great success by the National Institute of Pharmacy at Chicago. Druggists in business, who, by reason of competition, legislalative enactments or other causes, feel the need of a systematic course of study, will find these lectures of great service.

The desirability of adopting a national formulary, containing unofficial formulas for the most common pharmaceutical preparations, has received considerable attention. At the last meeting of the American Pharmaceutical Association, in Pittsburg, the formulary compiled by the pharmaceutical societies of the cities in New York and Brooklyn, was tendered for publication in the proceedings, and the joint committee, of which Lor. Chas. Rice, of New York, is chairman, was delegated to complete the work by such addition as may be necessary. The state associations were invited to report such formulas not already incorporated, as may be deemed desirable in their respective states, the formulary then, after final revision, to be adopted

at the next meeting of the American Pharmaccutical Association as a national work. This invitation has already been accepted by the Illinois Pharmaceutical Association, who have instructed a committee to report upon such formulas as may be deemed desirable for incorporation. This strikes me as a very good plan. The difficulty hitherto has been not so much a want of formulas as lack of uniformity, and the necessary feature can only be secured by having a national standard authority. With the desire to see the Michigan State Pharmaceutical Association represented as a contributor to this formulary, I recommend that a committee of five be appointed or elected to report upon such formulas as may be desirable in this state, not already incorporated in the work, and that the joint committee of the National Pharmacentical Association be requested to receive such report, also that two or three pharmacists who are in close communication with each other, go over the formulas of the New York and Brooklyn formulary with a view of suggesting any improvements their experience may dictate. Among the propositions before the National Retail Druggists' Association, at its recent Pittsburg meeting, was the adoption of measures to secure the removal of the internal revenue tax on alcohol used in the manufactures and arts, and another to secure the removal of the twenty-five dollars annual federal tax on druggists as retail liquor dealers. The first proposition appears too chimerical at present to merit serious notice; the second appears far from impracticable and would seem only to require a firm and united demand for repeal to secure that result. The tax is not only an insult to all respectable pharmacists who have no thought of doing other than a reputable business, and who, therefore, resent the governmental imputation of their being dramshop keepers, but it is opposed to every principle of equity and right. As a war measure, it was originally fully justifiable, but its perpetuation in times of peace in the face of an overflowing treasury, is wholly indefensible. I suggest that a special committee be appointed from this Association to co-operate with the committee of the National Retail Druggists' Association having the matter in charge.

A subject, which at first sight would appear to interest only such druggists as are located in or near the jobbing cities, is that of retailing by wholesalers. The practice is one fraught with much loss and great injustice to retail druggists everywhere. The city retailer finds himself in many instances forced to compete in prices with his jobber, from whom he naturally has a right to protection, by every principle of mercantile equity. Retail druggists in the smaller towns far distant from the jobbing center, feel the effects of the evil in a marked degree, also Their customers more or less often visit jobbing cities and in

various ways become conversant with jobbing prices. Thus values throughout the state become more or less demoralized, and the meager net profits of the drug business are subjected to greater shrinkage. I suggest that some action be taken expressive of our condemnation of wholesalers entering into

competition with their own patrons.

The campion plan having failed, and with it the national project for the regulation of prices on patent medicines, the sole remedy for the evil of "cut" prices would now seem to be a system of local organization wherever the evil exists. In Wisconsin and other states local societies have done much to uphold values, and their efficacy in Michigan, judged by the success of the Grand Rapids Association, would, no doubt, be equally pronounced.

In conclusion, gentlemen and fellow members of the Michigan Pharmaceutical Association, I beg to tender you my thanks for the courtesies I have received at your hands, and to express my appreciation of the honor conferred upon me by my election to be your President. If I have failed in any duty, as no doubt I have, it has been through no error of the heart and no faltering in my devotion to the interests of this Association and the lofty aims by which it is inspired.

Mr. Jesson, of Muskegon: I move that the President's address be referred to a special committee of three to consider the recommendations therein made and report.

Carried.

Mr. Brown, of Am Arbor: I would move, also, that the thanks of the Association be tendered to our President for his very able and interesting address, and for the many suggestions offered for our consideration.

Carried.

The President appointed as the committee to consider and report upon the President's address:

Mr. Wells, of Lansing.

Mr. Gundrum, of Ionia.

Mr. STEVENS, of Detroit.

THE PRESIDENT: The next business in order will be the presentation of names for membership. This session will be very short and we shall soon adjourn. The Association will now listen to the names proposed for membership.

The Secretary then read the following list of names:

Adamson, James W., Holly. Akey, J. V., Colon. Ahlborn, Augustus, Detroit. Allen, Eli F., Boyne City. Arnold, Wm. C., Ludington. Baar, Henry, Grand Haven. Bailey, George H., Elk Rapids. Baker, Dennis, Grand Rapids. Baker, William H., Whitehall. Bangs, William Z., Holland. Barrows, J. F., Lawrence. Barbarin, George F., Freeland. Barbour, William G., Fenton. Bassett, J. A., Detroit. Bence, G. W., Detroit. Bisbee, A. B., Benton Harber. Blocher, C., Millington. Bond, Ernest, Muskegon. Braddock, O. L., South Bay City. Gates, E. M., East Tawas. Browning, Gideon B., Decatur. Gallinger, E. L., Cadillac. Caldwell, Geo. G., Battle Creek.Grommon, P. D., Ovid. Cameron, Alex., Walton. Calkins, S. B., Millington. Carpenter, A. D., Mancelona. Carney, M. S., Decatur. Carroll, M. A., Ludington. Carroll, Watson, Ludington. Cleland, Henry, Detroit. Clark, William G., Detroit. Clark, S. U., Grand Rapids. Claxton, W. C., Detroit. Cole, Wm. W., Morenci. Cole, L. W., Petoskey. Coleman, Geo. A., Edmore. Hower, N., Mendon. Conway, V. R., Sault Ste. Marie. Howard, Chas., Alpena. Connine, Dewitt, Wexford. Howard, Wm. S., St. Joseph. Cooper, Isaac, Cheboygan. Cornell, E. A., Thedford. Couturier, Noel, Provement. Crawford, J. B., Ithaca. Cross, F. E., Grand Rapids. Currie, A. A., St. Clair.

Curtis, C. A., Petosky. Curtis, F. E., Napoleon. Dewey, C. E., Napoleon. Dodge, E. L., Montague. Dunn, G. B., Burr Oak. Dunning, N. A., Mason. Eldred B. C., Chesaning. Erskine, James, Rogers City. Escott, L. W., Grand Rapids. Everhart, Chas., Grand Ledge. Emster, F. H. J., van, Bay City. Falk, W. B., Howard City. Fatin, C. A., Almont. Fasquelle, L. J., St. Johns. Farnham, Edward, Casnovia. Bennett, Lewis T. E., Pt. Huron. Feldman, H., Sault Ste. Marie. Fenton, G. L., Kingsley. Fisk, C. A. E., Mancelona. Fritz, Theo. H., Cass City. Bruske, Rudolph, East Saginaw.Goldsmith, G. L., Manistee. Buchanan, S. C., Harrisville. Gorsuch, C. H., Waldron. Bugbee, Charles A., Cheboygan.Grasse, W. F., Sault Ste. Marie. Haenssler, G. J., Manchester. Hall, J. L., Chatham, Ont. Harrison, B. D., Sand Reach. Happy, Chas., Maybee. Harvey, E. C. F., Port Huron. Harshaw, W. D., Pontiac. Hamlen, R., Detroit. Harwood, H., Ishpeming. Heysett, Wm., Ludington. Hicks, Wm., St. Johns. Hinchman, C. C., Detroit. Hitchcock, W. A., Manistee. Hower, N., Mendon. Hueston, G. C., Northville. Hulton, R. J., Detroit. Hungerford, C. B., Northville. Hunt, A. O., St. Johns. Hurd, C. W., Davison Station. Hynes, Quincy, Hastings.

Ingram, E. J., Iron Mountain. Johnson, C. B., Palo. Johnston, A. J., Detroit. Richards, Geo., Ithaca. Johnston, A. M., Toronto, Ont. Rodenbaugh, O. S., Mancelona. Kay, G. A., Detroit. Kelly, David, Lyons. Kidd, A. J., Benton Harbor. Kirkwood, P. B., Negaunee. Kirtland, J. W., Lakeview. Klingman, Theo., Dexter. La Rue, C. M., West Bay City. Lee, Earl D., Ludington. Lee, John, Dexter. Le Fevre, G. L., Muskegon. Lentz, Theo., Detroit. Little, A. F., Spencer Creek. Litchfield, E. C., Flint. Locher, H E., Grand Rapids. Long, G. L., Detroit. Longwell, H. D., Paw Paw. Lonsbury, P. M., Reed City. Luce, jr., W. O., Caro. Lunn, G. D., Vestaburg. Mahon, F. M., Oscoda. Marr, T. W., Detroit. Mason, C. A., Flint. Martin, S. A., Pierson. Martyn, W. J., May. Maxson, M. W., Hudson. McDonald, M., St. Johns. McEvoy, J. E., Manistee. McInnis, M. V., Lapeer. Meyers, J. K., Muskegon. Miller, H. J., Fort Gratiot. Morrison, A. W., Constantine. Newman, E. P., Lansing. Noble, M. L., Reed City. North, S. J., Pontiac. Osborn, C. A., Owosso. Wales, T. P., Bay C. Padley, W. A., Benton Harbor, Walsh, H., Holland. Peck, J. E., Grand Rapids. Peckham, II. C., Freeport. Plant, G. W., Grand Rapids. Pratt, Stephen, Howell.

Rich, J. W., Manistee. Richards, F. P., Detroit. Ross, W. H., Grand Rapids. Roys, H. M., Farwell, Rumer, J. F., Richfield. Sayers, J. A., Seney. Schenck, C. E., Bic Rapids. Schafer, Wm., Carleton. Schimmel, G. R., Detroit. Schutz, L. S., St. Joc. Seibert, M. L., Marlette. Share, A. L., Evart. Sherlock, T. J., West Troy. Shireling, F. W., Grand Rapids. Shepherd, H. T., Detroit. Shotwell, R. H., Leslie. Sloan, E. E., Corunna. Snow, H. W., Detroit. Stanton, H. N., Sheridan. Stanton, M. B., Sheridan. Steketee, A. G., Grand Rapids. Stevenson, W. E., Homer. Sullivan, J. H., Whitehall. Tupper, F. L., Meredith. Taylor, C. W., Loomis. Tilton, B. E., Bay City. Tibbitts, A. H., Port Huron. Torontaly, P., East Tawas. Travis, F. A., St. Johns. Trempe, J., Sault Ste. Marie. Vander Veen, J., Gd. Haven. Van Leeuwen, W. H., G. Rapids. Van Vranken, G. D., Cadillac. Vedder, E. H., West Bay City. Vennema, H. A., Chatham, Ont. Wagar, F. E., Edmore. Wales, T. P., Bay City Parkhurst, C. G., Mason. Walthausen, G. L. F. von, B.City. Parkinson, E. A., Traverse City. Wallace, G. E., Hopkins Station. Weller, M., Fowler. Wheat, J. H., St. Johns Wheeler, O., Berrien Springs. White, A. F., Port Huron.

Preston, George, Escanaba.
Ray, G. C., West Bay City.
Witherspoon, G. A, Chatham, Wiede, Henry, Reese.
[Ont. Woods, T. T., Belleville.
Witherspoon, P. E., Harrison.
Williamson, G. E., Vas-ar.
Wilkins, F. C., Union City.

Willard, Thomas, Bear Lake.
Willard, W. H., Manistee.
Willard, Thomas, Bear Lake.
Willard, Thomas, Bear Lake.
Willard, Thomas, Bear Lake.
Willard, W. H., Manistee.
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Villard, W. H., Manistee.

THE PRESIDENT: The names as read will be referred to the Executive Committee.

Mr. Wells, of Lansing: I would inquire of the Secretary if the Executive Committee has acted upon these names?

THE SECRETARY: I think they have.

THE PRESIDENT: If the Executive Committee have acted upon the applications they may report immediately.

Mr. Brown, of Ann Arbor: The Executive Committee have looked over these applications since we came into the hall, but I cannot say we are quite ready to report upon them; we have thought the convention should have the privilege of having the names read to them at this meeting, and if there is any name to which any member sees fit to object, he can do so immediately after the close of this session. The committee will be at the Secretary's table, and the committee will also be here fifteen minutes before the commencement of the session this evening. The regular order of business calls for this report the first thing this evening. It is quite possible that a man may be recommended by two members of this Association, and yet it is quite possible that some other member of this Association may know some serious objection to that man becoming a member. The only thing the Executive Committee can do is to take it for granted that that man is fit to become a member of this Association. We find a good many applications were not properly filled; that is to say, a man would be recommended by two physicians of his town, neither members of the Association, while the law of the Association is, that every man shall be recommended by two members of the Association in good standing. In this case we made such inquiries as we could and in most cases our Secretary gave us the necessary information, which to us was satisfactory, but whether that would be satisfactory to the Association the committee are unable to state, and for those reasons it seemed best to the committee that this matter should be held open until evening, and in the meantime if there is any objection to any of these names read by the Secretary, the committee would be very glad if you will make it known immediately after the close of this session or immediately before the evening, when they will be prepared to report.

THE PRESIDENT: The gentleman is right about the order of business; the applicants cannot be elected until the committee reports, which will be at the evening session. The next order of business is the reports of officers and standing committees; under this head would come the reports of the Secretary, Treasurer and other officers of the Association.

THE SECRETARY: I would ask leave to defer my report until to-morrow, as it will be necessary to confer with the Executive Committee again before I can report.

Leave was granted postponing the reports of officers.

On motion of Mr. Brown, of Ann Arbor, the Association adjourned till 7:30 p. m.

SECOND SESSION.

TUESDAY EVENING.

The Association was called to order by President Crouter at 7:30 P. M.

Mr. Brown: Since adjournment the following names have been added to the list read at the afternoon session:

H. B. Bessac, Milan. F. S. Davis, Ypsilanti.

L. G. Blakeslee, Detroit.

W. E. Osborne, Grand Rapids. B. M. Patterson, Detroit.

R. H. Elliott, Pontiac.

B. F. Sweet, Carson City.

M. Steele, Ionia.

J. H. Tredwell, Detroit.

H. M. Williamson, Mason.

The Executive Committee would report that they have carefully examined all these applications and find them all properly recommended, and we would recommend their election to membership.

Dr. PARKILL, of Owosso: I move the report be accepted and adopted.

Carried.

THE PRESIDENT: The next order of business is the report of committees. We will listen to the report of the committee appointed to procure the passage of the Pharmacy Bill.

The committee, through its chairman, Mr. McDonald, of Kalamazoo, offered the following report:

REPORT OF COMMITTEE TO PROCURE PASSAGE OF PHARMACY BILL.

Mr. President, and Gentlemen of the Michigan State Pharmaceutical Association:

Your special committee appointed to procure the passage of the "Pharmacy Bill," would respectfully submit the following

report:

It is with great pleasure that your committee are able to report that, as you are already aware, the purpose for which the committee was formed has been accomplished, and with a greater measure of success than we had reason to anticipate. We wish it, however, to be distinctly understood, that we, by no means attribute this successful result to our own unaided efforts, and feel that we would be not only derelict in our duty, but also open to the charge of a gross lack of appreciation of the many obligations we are under to those gentlemen who rendered us such efficient aid, did we fail to make public acknowledgement of their services.

Prominent among those to whom we are indebted, are our ex-President, Mr. Frank Wells, of Lansing; our President, Mr. Crouter, who gave us his services for a week or more at the commencement of the session, and was with us again at the close; Mr. Davis, of Lansing; Messrs. Jesson and Wilson, of Muskegon; Mr. Gundrum, of Ionia, and Mr. Engelhard, of Chicago, editor of the Western Druggist, who rendered us very efficient service in presenting our case before the committees of the Senate and House, to whom our bill was referred, and in other ways.

In the Senate and House, despite the discouraging aspect of affairs in the early part of the session, we had many warm friends from the beginning. Prominent among those in the Senate, were Lieutenant-Governor Buttars, President of that body, and Senators Hueston, Carveth, S. W. Smith, Moon and Brown, and in the House, Messrs. Wilson, Ford, Collins, Bardwell, Howell, Smart, Black, Rumsey, Brown and others. We take great pleasure in stating that our intercourse with the committees of

both Houses to whom our bill had been referred, was always of the most cordial and pleasant character, and that these committees were favorably disposed towards our cause from the beginning.

In no less degree are we indebted to the members of this Association, and to the druggists of the state generally for their personal interviews with the members from their respective districts, and for their prompt and vigorous response to our calls for petitions to be sent in to our law-makers at Lansing. The Legislature was literally inundated with these petitions, and

their beneficial effect was unquestionable.

While your committee does not wish to make any invidious distinction where all did so well, we feel that we would not have done our full duty did we fail to testify in the strongest terms to the very valuable services rendered, not only to your committee, but to this Association as well, by one of its members, to whom we feel that we do but scant justice in saying that he did more for the success of our cause than any other one man. It became evident in the early part of the contest, that the fate of the Pharmacy Bill depended largely, if not wholly, upon the action of the Senate. If it failed to pass in that body, we felt that favorable action upon it by the House would be but a forlorn hope. If it passed in the Senate there was hope, notwithstanding the strong opposition that had developed in the House. that we might secure its passage through that body also. committee believe that the passage of the Pharmacy Bill by the Senate, was very largely due to the unremitting efforts of Mr. Frank Wells, of Lansing, who gave that body his daily attention for weeks, interviewing every member-many of them more than once. The action of the Senate seemed to be the pivotal point on which success or failure turned. The Senate passed the bill, by how close a vote, you all know. Success was then reasonably certain. We therefore feel justified in saying, that to Mr. Wells, more than to any other one man, we owe the passage of the Pharmacy Bill.

The Pharmacy Bill, in the form in which we now have it, is substantially the same as that recommended by this Association at its meeting last year. The arrangement of the sections has been changed. A few slight verbal changes were made, for the purpose of rendering some of the provisions of the bill less liable to misconstruction; and as was to be expected, some changes

and amendments were made by the Legislature.

The principal changes are as follows:

The term of years during which the members of the Board of Pharmacy should hold office is changed, making the full term five years, instead of four years, and making the terms of office of the members of the first Board respectively, one, two, three, four and five years, instead of two for two years and three for four years.

The Board is required to meet at least once in four months, and the days on which such meetings are to be held are specified

in the bill.

The records of the Board, or a copy of any part thereof, certified by the Secretary to be a true copy, attested by the seal of the Board shall be accepted as competent evidence in all courts of the state.

Provision is made for the election of a Treasurer of the Board

if deemed advisable.

The "per diem" pay of the members of the Board is reduced

from five dollars to three dollars.

All moneys received in excess of the expenses of the Board shall be paid into the state treasury at the end of each year, and so much thereof as may be necessary to meet the current expenses of said Board shall be subject to the order thereof, if in any year the receipts of said Board shall not be equal to its expenses.

The requirements for a clerk to obtain the certificate of a "Registered Pharmacist" is made three years' experience in a

drug store, instead of five years.

The fee for examination before the Board is made three dollars, instead of five dollars, and if the candidate fails to pass, the money shall be held to his credit for a second examination within one year, instead of three months.

Every "registered pharmacist" or "assistant registered pharmacist," changing his place of business, is required within ten (10) days after making such change to notify the Secretary of the Board of his new place of business.

The penalty clause is made more stringent.

The sections relative to adulteration, and the two sections relative to the sale of poisons, were omitted by your committee, as they were advised that their presence might perhaps invalidate the law. This opinion was based on the fact that Sec. 20 of Article IV. of the constitution of the state provides that "No law shall embrace more than one object, which shall be expressed in its title." The adulteration section was however reinstated in the Senate by an enemy of the bill, who probably thought that your committee would rather withdraw the bill, than have one passed embodying so stringent a provision.

There were more changes made in section 10 than in any other section. This is the section prescribing what articles may be sold by general dealers. A clause is inserted permitting any one doing business at a distance of not less than five miles from

the limits of any incorporated village or city to sell drugs and medicines, but prohibiting them from dispensing physicians' prescriptions. Another clause is inserted permitting any person to sell drugs, medicines and poisons when put up in bottles, boxes or packages, bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years and twenty-one years of age, and if a poison, the name or names of the most common antidotes. Tineture of aconite, and such acids as are used in coloring or tanning have been added to the list of articles that may be sold by any dealer. The original intention of that part of the section beginning with, "Nor with the selling of paregoric," and ending with "Quinine pills," has been radically changed by making "compound cathartic pills" and "quinine pills" the only articles in the list that are required to be put up in packages bearing the label of a registered pharmacist, with the name of article and directions for use on each package.

Only the senior pharmacist of each dispensing establishment

is made exempt from all jury duty.

The above, we believe, comprise all the changes of any importance.

It is pretty generally known that our Pharmacy Bill on its journey through the two houses of the Legislature met with many vicissitudes. Thinking that a record of its passage would be a matter of general interest to the members of this Associ-

ation, we submit the following:

The bill was introduced in the Senate by Hon. James Hueston. of the Third District, on January 28th, 1885. It was reported, without amendments, by the "Committee on Public Health," February 17th, and ordered printed; reported by "Committee of the Whole," with sundry amendments, and ordered printed March 3d, after a stormy contest lasting nearly two days; taken up by the Senate on the 17th of March, and after having received several amendments, was, in order to prevent its being further amended out of all semblance to its original self, or being entirely lost, re-referred to a joint committee made up of the "Committee on Public Health" and the "Committee on Judiciary;" it remained in the hands of this committee nearly The committee reported it back with numerous two months. modifications on May 5th, on which day it passed the "Committee of the Whole" a second time. On May 7th the bill passed the Senate by a very close vote; it received 17 votes, just enough to pass it, and no more; only two votes were recorded against the bill, and 13 refrained from voting, or were absent.

In the House, owing to some misunderstanding, two separate bills were introduced. The House "Committee on Public Health" reported back a substitute for the two bills, which substitute, however, was not satisfactory to your committee; we therefore requested the "Committee on Public Health" to see that it was not brought up for action before the House, except with our knowledge and consent, and asked them to promise their support for the bill then pending in the Senate, provided it passed that body. This they cordially assented to, and when the time

came, gave it their full and hearty support.

The Senate bill passed the "Committee of the Whole" of the House all right, and on May 26th came up in the regular order. The attendance, however, on that day was very light, and had it been allowed to come to a vote it would undoubtedly have been lost. Much to the chagrin of its opponents, however, the bill was laid upon the table. On May 28th, there being a full House, it was deemed safe to take it from the table, which was accordingly done, and the House passed it, with an amendment in section 10, giving 57 votes in its favor. The number of votes required was 51. Twenty-one (21) votes were recorded against it, and 22 refrained from voting, or were absent.

The bill having been amended in the House, rendered necessary its return to the Senate for that body to concur in the amendment. This was done, and on May 29th the Senate passed the bill as amended, recording 22 votes in its favor, and none against it. On June 2nd, his excellency, Gov. Alger, made it a law, by attaching his signature thereto. And thus ended the struggle.

GEORGE McDONALD,

Chairman of Committee to Procure Passage of Pharmacy Bill.

Mr. DUPONT, of Detroit: I move that the report of the committee be accepted and the committee be discharged.

Dr. Parkill, of Owosso: I move to amend by adding, "with the thanks of the Association."

The amendment being accepted, the motion was carried.

THE PRESIDENT: We will now have the report of the delegates to the American Pharmaceutical Association.

REPORT OF DELEGATES TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Mr. President, and Gentlemen of the Michigan State Pharmaceutical Association:

So fully are the details of the meeting at Pittsburg reported in the pharmaceutical journals, (especially the *Record*), that it seems indeed useless to occupy your time by a repetition of them.

Good work was done at every session.

It is a source of regret that so much time was occupied by business transactions and reports of committees, as on this account a large number of valuable papers were omitted. Though the papers will of course be given us in the reports, yet in this way we are deprived of the discussions arising therefrom, and it is not infrequent that the discussions are of as great value as the papers which call them forth. It is expected that this difficulty will be overcome next year, as a resolution passed at the meeting this year provides for a session, morning, afternoon and

evening of the second day of the meeting next year.

The adoption of the revised edition of the New York and

Brooklyn Unofficinal Formulary is worthy of mention.

One paper of especial interest and importance was that of J. U. Lloyd, in which he showed that solutions in passing through a simple filter may be essentially changed in their chemical composition.

Another paper by Dr. Eccles on "Infected Solutions," represented a vast amount of work, including over 500 tests on antiseptics. The paper was well illustrated with microscopical draw-

ings.

The retiring President recommended "that the proper test of fitness of candidates for a license of the State Examining Board is a state examination." This was approved by the committee and adopted by the Association. This item is of special interest to us at this time as it is a part of our bill.

As your delegates to the American Pharmaceutical Association we were indeed proud to represent you, and while we endeavored to represent you everywhere, it was with emotions peculiarly pleasurable to ourselves that we represented you at the entertainments whenever and wherever opportunity offered.

The entertainments were ample and of the most enjoyable kind, consisting of a concert, reception, supper, an excursion by boat to the Edgar Thompson Steel Works, an omnibus ride to the glass works and Armstrong Bro's Cork Works, a railroad excursion to the Pittsburg Plate Glass Works and the Natrona Chemical Works.

After such festivities it was with regret that we washed the smoke of Pittsburg from our faces to again take up the burdens of life.

Respectfully submitted for the delegation.

A. B. STEVENS, Chairman.

Dr. Lyons, of Detroit: Before this report is acted on and we pass from the subject, I wish to add one word farther. When the time for the election of officers arrived and the various candidates were proposed with more or less enthusiasm, it was very noticeable that when Dr. Prescott's name was mentioned for Second Vice-President of the Association, the enthusiasm was ten fold greater than that manifested upon the other nominations. It was evidently an expression of the feeling the Association entertains for a member of our Association of whom we have reason to be so proud.

A DELEGATE: I move that the report of the committee be accepted and the committee discharged.

Carried unanimously.

Mr. Brown, of Ann Arbor: If it is in order, the Executive Committee have three more names they would like to report upon.

THE PRESIDENT: If there is no objection, the rules will be suspended and the Executive Committee will be allowed to report.

Mr. Brown: We have the names of Michael Steele, of Ionia; Louis G. Blakesley, of Detroit, and Richard A. Elliott, of Pontiac, who have been properly recommended, and we would recommend their election as members of the Association.

Dr. Parkill, of Owosso: I move the report of the committee be adopted and the Secretary be instructed to cast the ballot of the Association for the names reported upon.

The Secretary cast a ballot, and the President declared the applicants elected.

THE PRESIDENT: Are there any further reports from the Executive Committee?

Mr. Brown: Nothing more at present; I will state that these applicants make 205 new members that have been elected at this session, and the total membership is now 659.

THE PRESIDENT: We will now pass to the next order of business—the reading and discussion of papers.

Dr. Lyons: I have here a short volunteer paper on one of the queries, or more properly, perhaps, upon one branch of a query, the query relating to the requirements of the German Pharmacopæia for podophyllin. [For the paper see subsequent pages.]

Mr. Gundrum, of Ionia: I move the paper read by Dr. Lyons be accepted by the Association with thanks, and ordered printed in the proceedings.

Carried.

THE PRESIDENT: Does any member of the Association wish to say anything upon this paper? If not, we will proceed with the next order of business. Are the delegates to the National Retail Druggists' Association ready to report?

Mr. Stevens, of Detroit: Mr. Perry is a member of that committee as well as Dr. Watts, who is not here. Mr. Perry has written a report which he intended to offer in case Dr. Watts did not come. In the absence of the chairman of that committee I presume he can read his own report better than Dr. Watts's, and I therefore move that he make the report of the delegation.

The motion being put, prevailed, and Mr. Perry read his report as follows:

REPORT OF THE DELEGATES TO THE NATIONAL RETAIL DRUGGISTS'
ASSOCIATION.

Mr. President, and Gentlemen of the Michigan State Pharmaceutical Association:

In the absence of the regular officers the meeting was called to order by Mr. E. A. Sayre, of Brooklyn, who nominated Mr. A. H. Hollister as presiding officer. Mr. Hollister was unanimously elected and responded briefly to the applause.

After prayer by the Rev. Mr. Potts, the Association was cordially welcomed by Mr. Geo. A. Kelly, local Secretary, who invited us to join in the entertainment and pleasures provided for the American Pharmaceutical Association.

The President's address was read by the Secretary, Mr. J. W.

Colcord.

The Treasurer's books showed that there was \$1,500.00 due from members, which if paid, would leave a balance in the treasury.

The following gentlemen were elected officers for the ensuing

year:

President—Mr. E. A. SAYER, of Brooklyn.

First Vice-President—Mr. A. H. HOLLISTER, of Wisconsin.

Second Vice-President—Mr. FRED. GRAZIER, of California.

Third Vice-President—Mr. A. H. FINLAY, of Louisiana.

Secretary—Mr. J. W. COLCORD, of Massachusetts.

Treasurer—Mr. F. A. Masi, of Virginia.

The following resolutions were adopted:

Resolved, That a committee of three, to be known as a Committee on Organization, should be appointed. The duty of this committee shall be to act in conjunction with the President in

the performance of his duties for the ensuing year.

Resolved, That we recommend to the National Retail Druggists' Association and to all pharmaceutical and trade druggists associations in the states and territories and the District of Columbia, the proposition of forming and conducting the affairs of the annual association on the basis of state delegations, composed of three members, retail druggists, for each state and territory and the District of Columbia, whose duty it shall be to present for debate and action all questions that affect the pharmacists and druggists throughout the union from a professional, legal and commercial standpoint.

Resolved, That such delegates be elected annually by each state association, who, when elected, shall receive instructions recommended by the Committee on Trade Interests and sustained by the Association at each annual meeting; said delegates to submit a written report of such meeting to their respective states, which, when provided, shall be printed in the annual

state proceedings.

Resolved, That the Nominating Committee be composed of one member from each association and five from the association

at large, to be appointed by the chair.

Resolved, That we recommend that the expenses of such delegates be paid out of the state association's treasury, and that such delegates be added to the standing committees and known as delegates to the National Retail Druggists' Association.

Resolved, That it shall be the duty of the President, with the aid of the Committee on Organization, to bring these resolutions to the notice of the several state pharmaceutical associations, and to use diligent efforts to induce them to co-operate with this Association to complete an organization on the afore-

mentioned plan.

Resolved, That the Committee on Organization when appointed, be authorized, in corresponding with the several state and district associations, to invite suggestions, and submit such questions as in their estimation will benefit this Association, and that they present a report at the next meeting of the National Retail Druggists' Association.

There were delegates from about twenty-five associations. The question of fire insurance received considerable attention and was freely discussed. The statistics which were presented,

showed that druggists were rated too high.

Attention was called to a circular which has been sent out by

a firm of lawyers in Washington, and a committee was appointed to investigate the matter.

The Association adjourned to meet next year at the same

place as the American Pharmaceutical Association.

F. W. R. PERRY,

 $m{D}$ e $lcm{g}$ ate.

Mr. Stevens: I move the report be accepted.

Carried.

Mr. Brown, of Ann Arbor: I would suggest, that while the report of the delegation to the National Retail Drug Association is before us, it may be expedient to consider their report. If the suggestions there made are carried out, it will become necessary to amend Article 8 of our by-laws.

THE PRESIDENT: That can properly be brought up under the head of Unfinished Business. We will now proceed with the reading of papers.

Dr. Lyons: We have a paper prepared by Mr. Dunn, on "Antidotes to be directed on Poison Labels," which will be read by Mr. Perry, of Detroit.

[For Mr Dunn's paper see subsequent pages.]

Mr. Gundrum, of Ionia: I move the paper be accepted.

Mr. Brown, of Ann Arbor: Before that motion is put, I would like to inquire whether the acceptance of a paper involves the understanding that it shall be printed in the proceedings?

Mr. GUNDRUM: That is my opinion and belief in the matter.

Mr. Wells, of Lansing: I would move as a substitute for Mr. Gundrum's motion, that all the papers read here during this session be published in the proceedings, unless there shall be objection to some paper, which I presume there will not be. We have heretofore published all the papers which have been read, and I believe it has been generally understood and expected they would be published. I think this paper is important as well as all other papers. I therefore offer as a substitute for the motion of Mr. Gundrum; that all papers read at this meeting be published in the proceedings.

Mr. Gundrum: I accept the amendment.

Mr. Brown, of Ann Arbor: Would it not be better to refer these papers to a Publication Committee; I know it involves an immense amount of work for the Secretary to go through all these papers and attend to the reading of the proof and all the other detail. The substance of many of these papers could be condensed and all that is valuable go into the proceedings. By judicious pruning by a publication committee less expense would be involved for printing. I do not speak of this with reference to this particular paper. I do not think I should be ready for one to have all the papers that will be read published, because, with the very large number of papers it will make a large volume of proceedings, involve a good deal of cost, and is it, after all, really valuable?

Dr. Lyons, of Detroit: I agree with the last speaker in the idea that there should be a Publication Committee to which the papers should be referred with discretion to publish in full or not, according to the value of the paper. At the same time, at the present, I think it is undoubtedly better and more apt to stimulate work in those who contribute papers to this Association if their papers shall be considered of sufficient value to be published in the proceedings. The time may come when we shall be overwhelmed with work of this kind, and we may be compelled to cut the matter down by the pruning process, but at present I don't think there is any danger that the bulk of our proceedings will be so great as to embarrass our Association.

Mr. Jesson, of Muskegon: This matter of papers is one we should be very careful about; other state associations have experienced considerable trouble in getting papers at all. I have copies of the proceedings of other states, and if the members of the Association will take the trouble to look them over, they will see that they do not have many papers. I can say with pride that we have an Association able to furnish better papers and a greater number of them than the American Pharmaceutical Association, and I think we can publish everything the members are ready to furnish with reference to the drug trade of the state of Michigan.

Mr. PARKER, of Detroit: It seems to me some of these papers ought to excite discussion, at any rate. I think every member

has an opinion upon these subjects; I did not state the form of label of this writer, and I will do so now. Perhaps you noticed in the reading he said he divided the poisons sold in drug stores into eight groups; then he proposes eight different labels; when a poison is sold, the druggist, by reference to his list can immediately tell under which group it comes; he then takes a label belonging to that group; on top of the label is the word "Group," with a number specifying the group to which the label belongs; then there is a blank space for the name of the poison, and just below is the treatment, as in ordinary poison labels, which you can buy of label printers, and below that the druggist's name. It seems to me to be a very simple and easy way of disposing of the poison label question. A druggist needs simply to have eight labels, after having all the poisons of his stock reduced to eight groups.

Mr. Bassett, of Detroit: I apprehend in this matter of papers that it is the desire of this Association to get all the papers it can. When these queries are brought before us they are accepted by different persons, and they come here expressing their ideas on the subjects they have chosen. If we are to turn those papers over to a publishing committee and have them incorporate their ideas in the place of those advanced by the person who wrote the paper, we had better turn the queries over to the publishing committee and let them publish their ideas in the first place. I don't think there is any danger of this Association being flooded with papers. If we are liable to have more papers than we want, cut the list of your queries down and you will reduce the number of your papers.

Mr. Gundrum, of Ionia: I am glad this paper on poison labels has been brought up, for not only does it reduce the number of labels, but it simplifies the matter and gives us antidotes that are reliable. I think it ought to be published, and yet I do not think Mr. Brown's remarks were entirely without force. If we have fifteen or twenty papers there might be something saved in referring them to a publication committee.

Dr. Lyons: The question before us is on disposing of this paper.

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Inviting orders from those not heretofore dealing with us, as well as from old and valued customers, we promise our best efforts to please.

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THE PRESIDENT: Mr. Gundrum, of Ionia, moved to accept this paper. Mr. Wells, of Lansing, moved, as a substitute for the motion, that the paper be accepted and printed in the proceedings; the question now arises on the substitute.

The substitute was adopted.

THE PRESIDENT: Discussion of the paper is now in order.

Dr. Lyons: This subject is a very interesting one, and I am very much pleased with the manner in which the subject has been dealt with in the paper. The antidote labels that I have had the opportunity of seeing, have disregarded one very important thing, namely, that the antidotes themselves are frequently poisons and are dangerous. The writer of this paper has confined himself to antidotes which can be safely used by any one, and if there is any way by which this can be made available to the pharmacists of Michigan generally, I wish action might be taken looking towards providing a series of labels like this, simple in design, covering the whole range of poisons, and enabling pharmacists to carry out thoroughly and in a correct way the intent of the law, which is certainly not done at present.

Mr. Wells, of Lansing: I think it is a subject of a great deal of importance, and that we ought not only to consider it, but we ought perhaps if possible to have this question of grouping considered by a committee. I do not know how much time or attention the author of the paper has given the subject, but it is one of great importance, and it seems to me will require a large amount of investigation to furnish in all cases simple antidotes for poisons; that is to say, to furnish antidotes as Dr. Lyons has stated, that are not poisons in themselves. The antidotes furnished should be those most consistent with safety. I have no doubt the author of the paper has succeeded in ciphering that out, but if he has not succeeded, it is certainly within the province of this Association to do it before sanctioning this list of poisons and groups of antidotes.

Mr. EBERBACH, of Ann Arbor: If my recollection serves me right, the former Michigan Pharmaceutical Association appointed a committee to formulate a list of poisons, which were at the time presented to the legislature of Michigan, and adopted in one of the sections of the Poison Act. The list was adopted, became a law, and all pharmacists of this state are legally bound to keep that list of labels with their antidotes. We have in our Pharmacopæia a list of some fifty or sixty labels for such articles as are designated poisons by legal action. Of these there are probably eight or ten used very frequently and the rest but very little. Now the proposition suggested in this paper is one that will greatly relieve pharmacists in that respect; it puts the whole schedule into a nut shell, and gives the pharmacists an opportunity to tell at a glance the antidotes for entire groups of poisonous substances. I think the paper is well worth consideration, and that the suggestion of ex-President Wells is a very good one, to appoint a committee to look into this matter and see whether it can be improved, and then have the Association endorse it.

Mr. Brown: I think while my friend Eberbach is correct in regard to the Association having prepared a list of antidotes for well known poisons, that he is not correct in stating it was adopted by the legislature, as in looking up the poison list last night the only reference I could find was to Section V. Chapter 123, which provides a punishment by fine, etc., but two or three poisons are the only ones mentioned. There is nothing said about antidotes, except that the label shall contain some simple antidote, if any be known. While I am up I will say, the ideas suggested by the author of this paper strike me as very good, and I think it would be very wise if we could have them investigated and brought out in some form by a committee. I can see only one objection, and that is, that a printed label is preferable to a written one: even if it is written in with a pen you frequently find young men in your employ who are not good penmen and it might be difficult to say whether it was arsenic or corrosive sublimate; so a printed label is better than a written one. Notwithstanding, I think the public would be better served by having poisons grouped. While I am up I would like to say, that Mr. Bassett certainly misunderstood my remarks before, if he supposed I intended to say that this publication committee should have the right to insert their own ideas into any paper. I certainly did not mean to say any such thing or imply it. If I did I wish to correct it.

Dr. LYONS: I think a motion would be in order in accordance with the suggestion of ex-President Wells, that a committee be appointed to whom this subject of the best method of carrying out the suggestions of this paper, which are excellent, shall be referred. Ithink myself, it would be easier to obviate the difficulty spoken of by Mr. Brown, by having the label prepared with an opening in the center, and a sheet with the names of all the poisons on it from which the name could be cut and first put on the bottle and afterwards the poison label with the antidote pasted over it, so you would have both labels printed, and you have then the printed label in good shape. I would move that a committee of three be appointed to give this subject careful study, and report in such a manner that the result of their study shall be incorporated in the proceedings of the present year, even if they are not able to make their report at this time.

Mr. Stringer, of Detroit: I ran across this idea several years ago, and I have been using it ever since. I have found it the best thing I have ever come across. I have on my desk a list of poisons and opposite an indication of the group each belongs to. I have six labels; the top of the label is plainly printed "Poison," and under that is a blank space to write in the name of the poison, and below that is the antidote. The antidotes are all simple articles such as were suggested in the paper, and below that is the name and address. Whatever the name of the poison is, we can write it in and the antidote is below. There is no difficulty at all about it; I think I have only six or seven labels; I find it very convenient and it saves a good deal of trouble in keeping a large stock of poison labels; and then, too, every customer gets an antidote, no matter what the poison is.

The motion being put, prevailed.

THE PRESIDENT: I will appoint as such committee, Dr. Lyons, of Detroit; Mr. Wells, of Lansing, and Mr. Stringer, of Detroit.

Mr. Wells asked to be excused from serving upon the committee owing to a press of private business.

On motion of Mr. Gundrum, the name of Mr. Eberbach was substituted in place of Mr. Wells. [For this committee's report see subsequent pages.]

THE PRESIDENT: What is the further pleasure of the Association?

Dr. LYONS: The last query on our list is one that calls for discussion. The question arose last year with regard to the proper names under which the compounds of Muriate of Cocaine are used. It excited so much interest at the time that I had the subject added to our list of queries, and I have a short introduction to a discussion on that subject whenever it is the pleasure of the Association to accept it.

A suggestion was made, that the Association defer the consideration of this subject until the next session.

The Executive Committee asked leave to submit the name of William H. Goodyear, for membership, with the recommendation of the committee that he be elected.

The Secretary was directed to cast the ballot of the Association for Mr. Goodyear, who was duly elected.

On motion of Mr. Gundrum, the Association adjourned until Wednesday morning.

THIRD SESSION.

OCTOBER 14-9 O'CLOCK, A. M.

The Association was called to order by the President, who announced that the first business of the morning was the reports of officers.

The Secretary submitted his report as follows:

SECRETARY'S REPORT.

To the Officers and Members of the Michigan State Pharmaceutical Association:

GENTLEMEN—At our last meeting, a trifle more than one year ago, when I read my report, we had a membership of 409; 43 names were added before the close, making a total of 452. We have lost by death, one active member, Mr. E. B. Escott, of Grand Rapids; also, one honorary member, Mr. H. B. Parsons, of New York. During this year I have received 165 applications for membership, which, if added to our list, gives us a total of 616, the largest state Pharmaceutical Association in the United States. The publication of the proceedings of our second annual meeting were delayed, on account of having to procure electrotypes of the specific gravity tables.

The report, I know, will compare as to quality favorably with the proceedings of other state associations. The cost of 1,000 copies was \$397.73. We received for the advertisements \$170,

leaving a net cost to the Association of \$227.73.

The labor connected with the Secretary's office during the past year, was heavy and quite expensive. On November 13, I had printed and mailed for the Committee on Pharmacy and Queries, a printed copy of queries; also an address and a printed copy of the proposed Pharmacy Act for the Special Committee

on Legislation.

On January 30th, 4,000 circulars and petitions, and on February 15th, 1,500 circulars and petitions were mailed for the last named committee. Some of these petitions were quite numerously signed by the public; several of them measuring 15 feet in length, and containing 500 names, were sent to the legislature. The proceedings were sent out about March 15, partly by mail and partly by express. Complimentary copies were sent to most of the state associations, scientific societies and pharmaceutical journals in the United States.

I have received, during the year, complimentary copies from

the following associations:

Connecticut, Illinois, Kentucky, Kansas, Massachusetts, Missouri, North Carolina, New York, Ohio, Virginia and Wisconsin.

Two thousand copies of the call and program for this meeting were printed, and a copy, together with an application blank, mailed to each member; also to every drug firm in the state.

I have used up during, the year, \$97.00 worth of stamps for the above work.

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The following orders have been drawn on the Treasurer, by							
the approval of the Executive Committee: No. 1, Sept. 11, A. W. Allen, printing, \$250							
" 2, " 11, J. Eby, printing, 100 " 3, " 11, Detroit Free Press, printing Pharmacy Act, 16 25							
"4, "11, Jacob Jesson, 200							
1, 11, 00000 000001,							
" 6, " 21, Herschel Whittaker, report, 50 00 " 7, Nov. 12, Calvert Co., 300 certificates, - 30 00							
1885.							
No. 9, Jan. 12, H. J. Brown, engrossing certificate, 65 00							
"10, "12, Special Legislative Committee, - 100 00							
"11, Feb. 20, McKay & Dana, on proceedings, 50 00							
"12, Apr. 24, McKay & Dana, on proceedings, - 170 75							
G. P. Engelhard, electrotypes, 59 33							
A. B. Lyons, " - 58 50							
J. Jesson, sundries, 104 40							
"13, July 13, Special Committee on Legislation, 208 80							
" 14, Oct. 13, Jacob Jesson, sundries, - 42 00							
"15, "13, Jacob Jesson's salary, 200 00							
"16, " McKay & Dana, printing, 38 15							
\$1,423 68							
All of which is respectfully submitted. JACOB JESSON, Secretary.							
Muskegon, October 13, 1885.							
THE PRESIDENT: The paper of the Scoretary will be referred							
to the Executive Committee.							
The Treasurer then submitted his report as follows:							
TREASURER'S REPORT.							
To the Officers and Members of the Michigan State Pharmaceutical Association:							
Sept. 11, To balance on hand, \$891.73							
RECEIPTS.							
Sept. 11, To cash, \$129 00							
April 27, " " 204 40							
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DISBURSEMENTS.	
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Respectfully submitted.

WM. DUPONT, Treasurer.

THE PRESIDENT: I do not just see the necessity of referring these reports to the Executive Committee, but such having been the course formerly it will be so referred.

Mr. Brown: The Executive Committee will be prepared to report in a short time, and asks permission to do so under the head of new business.

The Executive Committee reports the following names of applicants: Reynold H. Dunbar, of Parma; P. A. Sigler, of

Pinckney, and J. W. Leasia, of Williamston, with the recommendation that they be elected.

Mr. DUPONT, of Detroit: I move that the report of the Executive Committee be accepted and the Secretary cast the ballot of the Association.

The motion prevailed and the applicants were declared to be elected.

THE PRESIDENT: Are there any other reports of officers, or is there any unfinished business to come before the Association?

Mr. JESSON, of Muskegon: I don't know whether it would be in order, but I have a couple of communications I would like to submit.

THE PRESIDENT: If there is no objection the communications will be received.

The Secretary submitted the following letters from S. S. Garrigues, of Ann Arbor, and from Henry B. Parsons, of New York, in acknowledgement of their election as honorary members of the Association.

Ann Arbor, Mich., Sept. 16, 1884.

Jacob Jesson, Secretary of the Michigan State Pharmaceutical
Association, Muskegon, Mich.

My Dear Sir—I take pleasure in acknowledging the receipt of your kind letter, informing me of the honor conferred upon me in my unanimous election as honorary member of our State Pharmaceutical Association. Allow me through you, to return my thanks for this honor. The cause of pharmacy has always been very dear to me, and I trust that the recent pharmacy act, perfected by the Association, may become a law.

With an expression of regard, I remain truly yours, SAMUEL S. GARRIGUES.

72 WILLIAM ST., NEW YORK, September 18, 1884.

Mr. Jacob Jesson, Secretary Michigan State Pharmaceutical Association.

DEAR SIR—Permit me to return my sincere thanks, through you, to the Michigan State Pharmaceutical Association, for the honor conferred upon me at your recent meeting in Detroit. I have watched with interest the movement which resulted so successfully as regards organization; and while distance prevents

me from taking an active part in your proceedings, rest assured that I will gladly use my influence to aid any wise measures which your society may propose, for the advancement and elevation of pharmacy in this country.

Sincerely yours, HENRY B. PARSONS. (Signed)

Mr. Jesson: This letter of Mr. Parsons is particularly valuable at the present time, as Mr. Parsons was one of the brightest minds this country has ever had, and has died since the writing of this letter.

On motion of Mr. Wells, the letters were ordered printed in the proceedings.

Prof. Prescott, of Ann Arbor: If it is in order, I move that the President be requested to appoint a committee to prepare a minute upon the death of Mr. Parsons, for record in the proceedings of the Association.

Mr. Jesson: I would like to incorporate in that motion, the name of E. B. Escott, of Grand Rapids, who has also died since the last meeting.

Prof. Prescott: I accept the amendment.

The motion being put, prevailed.

Prof. Prescott: Is it in order to ask to submit a matter under the head of New Business, or would some other time be more suitable?

THE PRESIDENT: I think, if there is no objection, it may be considered under this head of business. The Chair will so rule.

Prof. Prescott: I have respectfully to report, that the faculty of the School of Pharmacy of the University of Michigan, have requested the Michigan State Pharmaceutical Association to appoint a Committee of Visitation to the School of Pharmacy and to report thereon to this Association at the next meeting. I do this by direction of the faculty of the school. I was about to make a motion to that effect, but inasmuch as it may perhaps be made to include the size of the committee I would prefer the motion be made by some one else. I have no motion to make regarding the formation of the committee or the size of it.

Mr. Brown: I would move that this Association appoint a committee of three to visit the school at Ann Arbor and report, as suggested by Prof. Prescott.

The motion prevailed.

Mr. Brown: I would suggest that the President appoint that committee.

. THE PRESIDENT: The motion was not to that effect.

On motion of Mr. EBERBACH, Dr. Lyons, of Detroit, was elected a member of the committee.

On motion of Mr. Stevens, Mr. Wells, of Lansing, was elected a second member of the committee.

On motion of Mr. INGLIS, Mr. Stevens, of Detroit, was elected a third member of that committee.

Mr. Stevens: I think it would be better if some one were appointed on that committee in my stead who is not a graduate of the Michigan School of Pharmacy. I think it would be better to take some one who knows less about it; some one from outside, who would perhaps be impartial in his report. Otherwise, I am willing to serve upon the committee; at the same time I think it would be better to take some one else.

Prof. Prescott: Will you allow me a word? I do not think it is necessary to change the committee—the majority of the committee not being graduates of that school. I beg to say that it is a good many years since Mr. Stevens graduated, and the school has changed very much since then. He may find something there that he was not conversant with at the time of of his graduation, at least.

Mr. Inglis, of Detroit: We all have great confidence in Mr. Stevens, and I think he had better serve.

THE PRESIDENT: Mr. Stevens has been duly elected a member of that committee and will serve.

The Executive Committee, through the chairman, Mr. Brown, announced that it was ready to report, and reported as follows:

REPORT OF EXECUTIVE COMMITTEE.

To the President, and Members of the Michigan State Pharmaceutical Association:

Your committee would report that since the last meeting of the Association, it has held but one meeting, namely, at Detroit, August 31st, to make arrangements for this meeting of the Association. Four members of the committee were present, as were also the President of our Association, the Local Secretary, Mr. Allen, and some others. The program, as printed, was agreed upon, and the Local Secretary was given some instructions as to the securing of a hall for our meetings and for the exhibits, and also directed to engage a stenographer. Your committee would advise, that in the election of the next Executive Committee, an effort be made to have at least three members elected whose place of residence is near the city where the next meeting is to be held. We make this suggestion because of the expense incurred and loss of time involved by members from a distance in attending meetings of the committee; and in order that the committee may always have upon it some one entirely familiar with the affairs of the Association, it is further recommended, that one at least, who has served in that capacity before should be re-elected. Your committee have carefully examined the books and accounts of the Treasurer and Secretary and find the reports which have been read by them to be correct. publication of the proceedings was left largely in the hands of our worthy Secretary, who did the work, as you are all aware, in the best manner. The expense of printing the specific gravity tables prepared with so much care by Dr. Lyons, was quite large, but the importance and character of the work, we think, fully justified the outlay. The expenses connected with the securing of the passage of the Pharmacy Bill were very moderate as compared with the amount expended in other states for like purposes.

All of which is respectfully submitted.

H. J. BROWN.
A. B. STEVENS.
W. H. KEELER.
GEO. GUNDRUM.
F. W. FINCHER.

Mr. Brown: I may say in addition to the report of the committee, that it may seem to the Association that the time given for the consideration of the report has been inadequate, but I would say that the committee spent several hours in its consideration, going over its items carefully, so it was a matter of form more than anything else that the committee went over the books again just now. Last year the net cost of the proceedings of the Association was only \$28; this year the cost was \$227.73; of course the volume is much larger and the expense

of printing and electrotyping the tables was very large and will account for the difference.

On motion of Mr. WILLIAMSON, the report of the committee was accepted and adopted.

Mr. Stevens: The report submitted has omitted one fact, which, I think, deserves attention from this Association. No bill has been presented by the Executive Committee for their expenses in coming here and attending the meeting. It seems to me unjust that the committee should come here to make arrangements for this meeting without being paid by the Association. They donate their time, and I think their traveling expenses should be borne by the Association. I speak of this, being one of the committee, after looking over the papers. As far as I am concerned, personally, I reside here in the city and am under no expense and do not ask any compensation. I think the same would be true of the committee of last year, although no bills whatever were presented. I will move that the members of those committees be instructed to present their accounts and that they be paid by this Association.

The motion being put, prevailed.

The President announced the following committee to prepare resolutions in memory of Henry B. Parsons and E. B. Escott:

Mr. Inglis, of Detroit.

Mr. Harwood, of Petoskey.

Mr. Kephart, of Berrien Springs.

Mr. Gundrum: I move that a committee be appointed on exhibits.

The motion prevailed and the President announced as a Committee on Exhibits:

W. E. SHORT, of Manistee.

O. B. DICKINSON, of Grand Haven.

J. W. CALDWELL, of Detroit.

W. H. PECK, of Morenci.

F. H. Escott, of Grand Rapids.

THE PRESIDENT: It occurs to me that there was a committee appointed last year which should report at this session.

THE SECRETARY: There is a regular Committee on Legislation and also a Committee on Code of Ethics.

THE PRESIDENT: The Committee on Code of Ethics is A. W. Allen, O. P. Safford, F. W. Fincher.

Mr. Stevens: I think none of them are present.

Mr. Brown: Mr. Allen told me that they had prepared no report and had done nothing whatever about it.

THE PRESIDENT: If there is nothing further under this head of Unfinished Business, we will pass to the next order, the continuation of the reading of papers and discussion of the same.

Dr. Lyons: We will listen directly to a paper by Mr. Gundrum, but I thought as a matter of interest, without any paper on the subject, I would show to the members of the Association present, a few forms of the crystalization of some salts of cocaine. The subject is one that has been of general interest for the last few months. The salt most commonly used, the hydro-chlorate, is generally offered in amorphous form or in crystals. I will allow these specimens to be passed around for inspection, explaining that the crystals of hydro-bromate speak for themselves: hydro-bromate of cocaine crystals formed in a watery solution; the hydro-chlorate is so very soluble in water that unless a considerable amount of the salt is dissolved it is impossible to obtain crystals, the crystals forming such a confused mass that they cannot be put in shape for market, but by working a considerable amount of salt, crystals can be obtained, though they are similar in constitution to those of hydro-bromate. This I exhibit here because they are somewhat rare; they contain about nine per cent. of water of crystalization. The product, of course, is much more handsome to the eye than the ordinary crystals. the ordinary crystals obtained being very small and quite microscopic.

Prof. Prescott: The answer to Query 18, "What is the strength of water of ammonia and the mineral acids used in dispensing pharmacy," will be given by Mr. George Gundrum, of Ionia.

The paper was then read by Mr. Gundrum.

[For paper see subsequent pages.]

THE PRESIDENT: The paper is now open for discussion.

Dr. Lyons: I would like to ask one or two questions; one, as to the source of the samples; whether they are supposed to be the ordinary commercial samples bought at various places?

Mr. Gundrum: Yes; the samples were procured mostly from the western part of the state. I procured four samples in Detroit of each of the different kinds. One came from Saginaw, one from Bay City, three from Lansing, one from Owosso, one from South Lyon, one from Brighton, from the dispensing stores of our druggists, and I stated to them what they were wanted for, and while I asked for the commercial acids, a few members stated they did not use commercial acids in dispensing and sent me some C. P. acids as well.

Dr. Lyons: The other question was partly answered by the paper, as to the strength.

Mr. Gundrum: The ordinary strength. I would state that the work was done last week so the experiments are very recent.

Dr. Lyons: One suggestion. A standard solution for estimation of acids or alkalies is sometimes a little difficult to prepare. You cannot always obtain pure oxalic acid. At any rate you cannot be certain that the acid you buy as pure does actually contain the normal amount of water of crystalization. You can generally procure a pure sulphuric acid, and I have been in the habit of preparing my standard solution from this acid. make the solution of normal or decinormal strength, approximately, and then ascertain its exact strength by simply evaporating a weighed (or measured) portion of it with excess of pure ammonia. The residue of ammonium sulphate, when perfectly dry, is weighed and from this weight the exact quantity of acid in the solution is readily calculated, sixty-six parts of the salt corresponding with forty-nine parts of sulphuric acid (H₂ SO₄.) After weighing the sulphate, you may ignite gently to ascertain whether the acid was really pure; if there is any residue this must be deducted from the weight of the sulphate, but in such a case your materials being impure, you cannot have perfect confidence in your results.

Mr. Gundrum: The solution I compared my work with was a solution prepared by Dr. Squibb. I took it for granted that Squibb's solution could be relied upon. I have some C. P. oxalic acid in the store that I procured a few years ago; I weighed that out, making, however, only half the quantity as my jar was too small. It was within a fraction of Dr. Squibb's. I think it only varied a fraction in fifty cubic centimetres.

THE PRESIDENT: If there is no further discussion on this paper it will take the course provided for by the resolution of Mr. Wells and be printed in the proceedings.

Prof. Prescott: I will read briefly some portions of a paper on the "Pepsins of the Trade" presented by William F. Lincoln of the School of Pharmacy of the University.

The paper was then read by Prof. Prescott.

[For paper see subsequent pages.]

Prof. Prescott: I might say in addition to this paper that there is some little difficulty in taking the solubility of albumen or the albumenoid of pepsin as a measure of strength, because not all dissolved substances are capable of absorption by the stomach. Probably only the dyalized portion should be weighed or estimated in measuring the digestive power of pepsin.

Dr. Lyons: I hope we shall hear from several persons upon this subject. It is one that has interested me a great deal.

Mr. Wells, of Lansing: It seems to me that in this paper as well as in a great many other papers of this kind that are presented, not only to this Association but to other associations, there is one thing lacking, and that is that the paper does not state the name of the manufacturer of the different articles tested. In order to make these tests valuable to an association of druggists, the association should know the manufacturers of the different articles tested, to enable them to determine from whom to purchase. I can understand the delicacy a gentleman may have in making tests of the products of different manufacturers and placing in a paper of this kind their names, especially so if the products do not come up to the required standard. At the same time it seems to me the papers could be made much more valuable to the association by so doing and that the interests of the association only should be considered.

Mr. GLADDING, of Constantine: I agree with Mr. Wells, and I think it would be well to have the names of the manufacturers and a statement of the samples received from them, so that the Association may know who has the best article.

Mr. Gundrum: When you come to undertake that business you will have more on your hands than you think you have. They will bring up some samples you have not tried and claim they are better. Besides that, no one cares to come here and defend himself against all objections that might be made if such a course were adopted. If any gentlemen are very desirous of informing themselves on these points, I think if they will consult with the parties who make the tests the facts can be ascertained, thus avoiding the necessity of a person coming here and publishing that the products of such and such a house are not up to the standard. I have no doubt that a great many of them would like to state who makes good goods, and for that very reason it is not best to publish any particular house here. For instance, I have three C. P. acids which I examined of very good strength, still I do not want to state where they came from. do not want to give anybody a puff here. If anybody desires to know so far as the acid is concerned I can inform him.

Mr. EBERBACH: I have had a little experience in the matter of the publication of the names as suggested in public proceedings. Several years ago I offered a paper upon a certain article at the meeting of the American Pharmaceutical Association in Philadelphia, and the paper caused a hot discussion, as it involved, incidentally, a comparison between the products of Dr. Squibb, of Brooklyn, and Daniel Robbins, of New York. iel Robbins attacked the paper, in which I think he was perfeetly justified. As Mr. Wells remarked a few moments ago, if the papers are to be of any value to the Association, I think we ought to know where the materials tested are manufactured. If manufacturers are to make a poor article, if the articles do not meet their standard, it is their duty to bring them there. If the investigations are erroneous I suppose the party making the investigations ought to be willing to have the error pointed out to him. I suppose it is not very agreeable, at the same time if we desire to make these things practical we ought to know the source.

Prof. Prescott: This is a point that perforce I have given a great deal of attention to. Any report upon the commercial quality of an article like pepsin or any other article, has service to the firm published; service of two kinds. Firstly, as showing the quality of the articles in current use, and the grade and degree of their variation. Secondly, a report may have service as showing which particular manufacturers furnished the articles, and so advise purchasers. It will be readily seen that the task of making reports on articles in common use is a very different task from making a report specifically upon the relative merits of different manufacturers. This report, I am confident. presents the author's individual determination, but it would also present the endorsement of the School of Pharmacy, because it is offered through the School of Pharmacy. This report, I am confident, is a useful report, giving a correct statement of the quality of pepsins in general use so far as that quality can be measured by the methods here stipulated; further than that I could not go with regard to that report.

If different manufacturers are to be rated before the public upon the results, in the first place, greater precaution should be taken in procuring samples, and no manufacturer should be judged by one sample. Certainly not; a considerable number of samples should be presented and obtained in different places and of different ages of manufacture, in order to give a fair index of the merits of the product of any manufacturer. I presume in a great many cases the purchaser does not obtain a sealed package; he takes the dispenser's word for it, that he took it from such a package. No manufacturer would be willing to rest his reputation upon an article taken out of a broken package at some drug store at a distance, without knowing how long it had been there. And if you were going to report upon manufacturers' specific articles, a person must be very careful and observe all these precautions. The material must have been in the first place obtained from an unbroken package. Then it must be guarded by the analyst from interference by interested parties, so that he can swear positively that it was the article. So there are very serious

difficulties in presenting a report to any scientific or professional society regarding the products of different manufacturers aside from the question of personal discussion, which might prove an embarrassing question to any body like this.

Mr. Harper, of Milan: The best safeguard, in my mind, is that each pharmacist should be competent to test the specimen he gets. I have followed that course since I have been in business, and uniformly I get a good article; if it proves not to be so my wholesale house exchanges it and thanks me for the report. I find them very accommodating and I think it is the best defense by which we can protect our customers, by being able to assure them that what we sell is perfect and not adulterated.

Mr. Stevens: I think the remarks of Prof. Prescott are worthy of consideration, not only in avoiding the danger we are liable to in antagonizing the manufacturer, but in relation to an examination of one sample only. It is easy enough, perhaps, for a manufacturing house, whether a small house or a large one, through some accident of their dispensing chemist, to produce some article below par, and in such a case we might happen to get just such a sample, and by advertising it do them an immense injustice, whereas, they might be perfectly accurate as to the rest of that preparation. To illustrate: A short time ago, to some extent, a house manufactured a poor article; it had been examined and the house was warned that the sample of the preparation they were sending out was not up to standard. The report was made and published in such a way that the house was known. I have no doubt it hurt the house very much, and perhaps in this case very justly, but in many cases it is the result of accident and a publication would be unjust. there is another point worthy of consideration; if all of us who have papers are compelled to give the names of the house from which we obtain the samples, do you not think it would have the effect of making persons decline to give papers? Hardly any of us would care to come here and present a charge of that kind against a house in this town, perhaps. I have a paper which I shall present this afternoon, in which the samples came from the wholesale houses in this city. Do you suppose I want to single out any of these houses and name them? It will, however, bring out one thing worth remembering; it shows us there are samples that are inferior and will lead us to examine our own preparations and result in giving us a method by which we can examine them easily ourselves; then I think the objects of the paper will be accomplished.

Mr. Wells: I wish to suggest this, that in practical pharmacy a mistake is a crime, and I do not know why it should not be on the part of the manufacturer. I think every manufacturer of a product should be held rigidly accountable for what he does. I think one province of this Association is to find out who manufactures the best goods for our customers. Of course this Association cannot by resolution require those who produce papers here that involve the testing of various manufactured products, to state the names of the manufacturers; but I do say this, that it will add very much to their value. As my friend Gundrum says, we don't care to puff manufacturers. I think the manufacturer who shows by his product that he is not up to the standard should be branded, and if possible, censured. It is a matter of great importance, and I sincerely hope that those who hereafter examine products will be particular to obtain those that they know are genuine, that have not been tampered with by the druggists from whom they obtain the sample, the packages of which have not been opened, and so far as they are willing to do so give us the names of the manufacturers. papers, as Prof. Prescott has well said, are very valuable in themselves without the names, but they are rendered very much more valuable to us as druggists if they contain the names of the manufacturers.

Mr. Bassett, of Detroit: I wholly concur in the remarks of Prof. Prescott, or I should concur in them were I not a jobber of these articles. But it strikes me that the first object of the papers that are presented to this Association is the benefit of the retail dealer, the man who dispenses the articles manufactured by those who present them to us and ask us to dispense them. We must necessarily, a large number of us at least, dispense these articles on the say-so of the manufacturer, as to

their reliability and strength. This question has a two-fold aspect, as the Professor has said. One is the general utility of an article as it relates to the public, and the public should be informed on that point. The other is as to the specific use of that article and what it will accomplish specifically. That part of it the retail dealer has in his own hands, and he should be thoroughly posted upon it. The public do not know those facts, the facts are not published in such a manner that they come before them. They are published in journals which the retail druggist reads and from which he informs himself. Now, if the manufacturer comes to us and states that his goods are so and so, he should be willing to submit them to a test of this kind and have it published. It may of course redound to his credit if they are up to the standard, and if it is to his disadvantage he should be willing to submit to that test. If these papers are prepared on samples obtained from sources which are not reliable, we do not want them. We want papers that are brought here prepared with skill to be published so that they may become a source of information to the retail druggists of this State. That is one of the first objects of this Association. Some of us in the larger places have not the time to make tests, but we are constantly besieged by manufacturers from all over the country to examine their goods, and they are not backward about stating what those goods will do or in labeling them as of the best strength. Why should they not submit to the test? We have in our city a large manufacturing concern and they employ a man to test their goods, and they claim they test everything that goes out of their laboratory before it comes into our hands; they have Dr. Lyons for that purpose, and it is for us to prove or disprove their tests.

Dr. Lyons: There is much to be said on this question on both sides. What I especially want to say is in support of what Prof. Prescott has said, that a report that is made to a society of this kind is in the nature of the case incomplete, especially when a subject like that of pepsin is in question. No mention of that is made in the paper. No one who knows anything about the subject can doubt that pepsin is liable to deteriorate and that a specimen three years old is not so good as one that is

fresh. Any series of tests like this is very misleading. It is all well enough to say it is information valuable to the members of the association, but manufacturers keep close watch of every publication of this kind, and the particular manufacturer whose goods are favored in an article will use that forever and ever as an endorsement of his goods. I have had some experience of that kind myself. More than fifteen years ago I published, without giving names, some analyses of quinine pills, and was foolish enough to allow myself afterward to privately intimate to one of the manufacturers whose pills were good and contained the full amount of quinine, the fact I had determined, and the result was that my name got into the papers as endorsing the manufactures of that firm, and will so remain I suppose forever and ever. Now, I do not wish to place myself in such a position as that, and that is the inevitable result of work of this kind if names are given.

Mr. Gundrum: I think if our members will take the trouble to go to the author of a paper and talk with him, or send him a postal card asking him questions on the matter, they can obtain such information as they desire, and I think the members cannot be very much interested in the subject if they do not do so. While it might be very desirable to know whose goods to buy and whose to shun I think we would find that very few papers would be presented here if such a rule was laid down. It is, as Dr. Lyons has said, that you are liable to get a poor sample in some way and thereby do the manufacturer injustice, and they would attack the paper and even the writer of it perhaps. I think for that reason it is not well to state here the manufacturers' names unless there is more than ordinary reason for it.

Mr. Jesson: There is one point connected with this subject that I would like to refer to, and that is that in the last revision of the Pharmacopœia, tests are given for nearly every article. Those tests are easily applied and I think there is not a retail druggist in the State of Michigan who is not able to make them. Let each druggist apply those tests to his own satisfaction, and he will get a general idea of what the article is, and he can in many cases verify these tests himself. It will occupy

but a very few minutes of his time, the tests are easy applied and it seems to me it would be a proper thing to do.

Mr. Wells: I would make this as a suggestion—of course nothing the Association could do would be binding upon the writer of any paper—I wish simply to call the attention of the members to the fact that papers can be made of more value if those who furnish them will also furnish the names of the parties whose articles they have tested. If they do not wish to do it, they cannot be forced to do it, but if any one has the moral courage to do so, I think it would be of very great advantage to the Association.

Mr. Harper, of Milan: I endorse Dr. Lyons's views in the matter fully; that as an association we do not want to antagonize any manufacturer. As Mr. Jesson has said we have simple tests and we should attend to it if we have to sit up nights to determine whether or not we have a good article. We should be sure that we protect our 'customers. I protest against advertising any manufacturing house. I have found to my cost that it does not pay, and I will never do it again if I am in my right senses.

Dr. Lyons: Perhaps this discussion has proceeded far enough but I had a few words that I wished to say about the paper. The testing of pepsin is a difficult matter. The test of the Pharmacopæia is the one which is most commonly used. Coagulated white of an egg is the substance to be acted upon by the pepsin with a certain amount of hydro-chloric acid. In the first place the test itself is a bad one, because, as any one who has had experience knows, the same pepsin will do the same thing hardly twice in succession. It is bad in the second place because in the way the test is made, the albumen is required merely to be dissolved, not actually converted into peptone. In fact, but little pertone is formed, the albumen being converted mostly into acid albumen, which may be precipitated by simply neutralizing the solution. Better tests have been proposed. If the Pharmacopæial test is to be adhered to, certainly its conditions ought to be more distinctly specified. The matter of the division of the albumen is a very important one;

whether it is to be taken as in the German Pharmacopæia in fragments the size of a lentil, or whether it is to be passed through a 30-mesh sieve, or whether the white of egg is to be mixed with a large amount of water, then coagulated by boiling. In each case you will get a different result. fineness of the division ought certainly to be specified. is necessary in reporting results of this kind to be very explicit in the details of manipulation. We don't know in the assays here reported whether the quantity of pepsin and water was the same in every case or not. If they were the results are not good, because there must be a certain relation between the amount of pepsin and the amount of water in order to get constant results. If one pepsin is four times as strong as the other you must take only one-fourth as much in making your test, if the same quantity of water and acid is used in each case. Judging from the results reported I should think that that mistake had been made; that the quantity of the stronger pepsins had not been reduced proportionately. Then a third difficulty comes in determining the weights of the albumen dissolved. You may assume that the coagulated white of egg contains seven-eights water and only twelve and a half per cent of solid matter; it is weighed in the first instance of course without drying, and when you come to weigh the residue left you find that it is in a pulpy condition; you cannot dry it between blotting paper so as to get any approximate weight. The only thing you can do is to dry it down completely, and multiply this weight by eight in order to obtain the true amount of albumen in a moist condition. Nothing said about this, either, in the pharmacopæial account of the test. I should be in favor most emphatically of substituting for this test that adopted by the French; using fibrine washed to free it from blood, and insisting that there shall be complete peptonization, not merely solution thereof. This test is the only one in my experience that gives at all constant and reliable results.

The President here called Mr. Wurzburg to the Chair.

On motion of Mr. Gundrum, it was ordered that the reading of papers be proceeded with.

Prof. Prescott: I would like to make a request on behalf of the Committee on Queries. If any members are present who have papers, the acceptance of which is not noted in the proceedings, will they please make it known to some member of the Committee on Queries. I have carelessly left the corrected copy of the list of queries at home and I have nothing to guide me except a copy of the proceedings. There were a few queries proposed after the proceedings were published, and that may account for any omissions. The next paper will be read by the Secretary, Mr. Jesson, in answer to Query No. 16, entitled, "A list of Galenical solutions and other preparations which can most advantageously be made by the dispensing pharmacist, but which are now largely purchased ready-made."

The paper was then read by Mr. Jesson.

[For paper see subsequent pages.]

Mr. Parker, of Detroit: I should like to ask Mr. Jesson, if in figuring the cost of tinetures, he took into consideration the recovering of the alcohol absorbed by the powders?

Mr. Jesson: I did not.

Mr. PARKER: And also if there is any account taken of rent, time and so forth?

Mr. JESSON: I did not figure time; every druggist has plenty of time to make his own preparations.

Mr. Wells: I recommend very strongly to the gentlemen of this Association that they make all the preparations that it is possible for them to manufacture. I have been in the habit myself for a great many years of manufacturing nearly all of these articles and with a good deal of profit. Fifteen years ago I commenced manufacturing all my fluid extracts and nearly all of my clixirs; occasionally, of course, there is one of especial manufacture that I am obliged to keep. It is something that all druggists can do. I presume it is true that nearly all druggists manufacture their tinctures, but I think it is very rarely found that pharmacists manufacture their fluid extracts; but by giving the subject a little attention they will find that they can manufacture just as good an article as they can purchase, and it will be fully as good and as uniform in strength.

Mr. Eberbach: I think the paper read by Mr. Jesson is one of great importance at this moment in Michigan, as she has advanced to the front of the line in the enactment of a pharmacy law. I think it is the duty of every member of this Asso. ciation, and in fact the duty of every druggist in the state of Michigan, to look into this matter, not merely from a pecuniary, but from an educational point of view. We are put upon the basis of educating the young men in our employ now, and this is one of the sources by which we can do it effectually. Our young men are obliged to look up these matters and investigate into the character and quality of drugs that enter into their manipulations, and by so doing it qualifies them for and makes them better candidates for examination. I think it is a point of the greatest importance that the members of the Association should look into this matter and see that the many spare moments we have in the smaller towns are turned to account in this way by our young men, in making these preparations. As far as the influence of physicians is concerned, in demanding certain preparations, we have a great deal of experience in that line at our Pharmacy in Ann Arbor; we have the consent of every physician in Ann Arbor to use our preparations, even when they ask for a special preparation; if Dr. Squibb's fluidextracts are asked for, we have permission to use our own, as we have the confidence and respect of the physicians; and I think every druggist can obtain the same permission and right if he sees his physician and explains the matter to him.

Mr. Jesson: Mr. President, I wish to say a few words in regard to a point I discovered in a wholesale drug store in an adjoining State. I was shown over the store by one of the proprietors, and I noticed a lot of old fluid extracts sitting on a shelf; they had probably been out of the market for fifteen or twenty years—in fact, I do not recollect of knowing anything about the manufacturer; I looked at them, they were stained and dusty, and some of them were half full of precipitate. I asked him what he did with them, and he answered, "We make winter tincture of that stuff and send it out to the country druggists."

Dr. S. S. Garrigues, of Ann Arbor: I have had some opportunity of looking this matter over in my early connection with the pharmaceutical profession; we call ourselves a profession; we bring our young men into the store and stand them behind the counter just to sell goods that are there; they are merely buyers and sellers; but by giving them an opportunity to become acquainted with the qualities of drugs, as they necessarily will in manipulations connected with the production of extracts and tinctures, we give the young men something to learn that will be a credit to them. I think this is a subject which demands attention from all who belong to the profession.

Dr. Prescott: We will now listen to two papers by Mr. T. J. Wrampelmeier of the school of Pharmacy of the University, in answer to Queries Nos. 12 and 13.

Mr. T. J. Wrampelmeier then read a paper in answer to query No. 12: "Oleate of zinc, its preparation and properties. Is the article sold under this name a true oleate?"

Mr. T. J. Wrampelmeier read also a paper in answer to Query No. 13: "Oleate of arsenic; can a chemical compound of this name be formed? What is the character of the article furnished as oleate of arsenic?"

[For papers see subsequent pages.]

Dr. Lyons: In regard to this oleate of arsenic, the question was raised some time ago whether it was possible for oleic acid to combine with arsenic, arsenic taking the part of a base. We find arsenic unites with difficulty with the hydrogen acids forming compounds decomposed even by water, and so far as I am aware it does not combine with the ordinary oxygen acids. It seemed highly improbable that oleic acid, a feeble acid, although of course it is not exactly analagous with the inorganic acids, should combine with arsenious oxide which is not a base under ordinary circumstances. It forms an acid rather than a base.

Dr. Shoemaker, who first recommended the oleate of arsenic as a therapeutic agent, stated that it was made by preparing an arsenious chloride by dissolving metallic arsenic in hydrochloric acid, and decomposing with this a solution of castile soap. It is evident that this plan would not succeed, since

hydrochloric acid does not dissolve metallic arsenic; but a friend of mine who was confident that, since Dr. Shoemaker prescribed oleate of arsenic, such a compound must have an existence, prepared what he believed to be the compound in question. He employed an alcoholic solution of soap, which he decomposed by a solution of pure (†) arsenious chloride in glycerine, and he sent me a sample of the product as a convincing argument as to the existence of an oleate of the metal.

I made an examination and found that while it did contain arsenic, I think several per cent., considerably more than is present in the compounds that have been spoken of, it consisted of a compound of antimony forming about one-half of it, while fully one-third of it was simply oleate of iron, showing that the arsenious chloride used must have been a very imperfect article.

I should like to hear the views of members of the Association with regard to the oleate of zinc. It is true that the pure oleate of zinc—using the term pure in a comparative sense—is a soft substance; the question arises whether there is any reason why pure oleate of zinc should be preferred to the ordinary powdered product—oleo palmitate—from which the therapeutic effects of oleate of zinc have become known to us; the powder is dusted over the surfaces to which it is applied; a pure oleate could not by any possibility be substituted for it.

Mr. WRAMPELMEIER: I think the true cleate of zinc is a soft substance.

Mr. EBERBACH: I would like to ask whether the soft substance, the true cleate of zinc, is not really a mixture of cleic acid with cleate of zinc.

Dr Lyons: The pure cleate is a soft substance; there is not necessarily any admixture with it of free cleic acid. The cleate can be easily separated from the palmitate (and stearate) by ether. Ether readily dissolves it. The residue on evaporating the solution is always a soft substance.

The Association then adjourned to meet at 2 o'clock, P. M.

FOURTH SESSION.

WEDNESDAY, OCTOBER 14-2 O'CLOCK, P. M.

The Association was called to order by the President, who stated that the first order of business would be the report of the committee on the President's Address.

The committee through the Chairman, Mr. Wells, presented the following report:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

To the Michigan State Pharmaceutical Association:

Your committee to whom was referred the President's address and the recommendations contained therein, have had the same under consideration, and report that they find the entire paper admirable in tone and filled with most sensible and timely suggestions. In both letter and spirit it breathes an earnest devotion to the best interests of pharmacy and the advancement of the objects of our Association. Its recommendations show an intelligent conception of many of the needs of the profession and the remedies they require. Though some of these recommendations are not of a nature to require action by the Association collectively, they are worthy of earnest study by us as individuals with a view to their adoption in our practice.

The recommendation that by-law No 3 be amended by striking out all after the word "Secretary," we approve with the suggestion that blank forms of application for membership be made to read hereafter as follows: "Approving of the objects of the Michigan State Pharmaceutical Association, and being desirous of becoming one of its members, I hereby make application for that purpose and signify my approval of its Constitu-

tion and by-laws."

The recommendation that steps be taken as soon as practicable to secure the incorporation of this Association is approved, but as this cannot be accomplished until the next session of the legislature we recommend that any action be deferred until our next meeting.

We also approve the recommendation that we seek to establish friendly relations with the associations of neighboring States by sending delegates to represent us at their meetings.

The recommendation for the appointment of a committee of five to act in conjunction with a committee of the American Pharmaceutical Association for revising and perfecting the formulary adopted by that association is approved.

While we approve the recommendation of the President that a committee be appointed to act in concert with the one appointed by the National Retail Druggists' Association, for the purpose of securing the repeal of the license tax upon druggists for the sale of distilled spirits, and also the tax upon spirits used or sold for medicinal purposes, we do not approve of both objects for which the committee is expected to labor. The license tax upon druggists who sell liquors for medicinal purposes only is both unjust and degrading, and this Association should most heartily second any effort of the National Retail Druggists' Association to secure its repeal. Your committee believe these efforts should stop here and not be directed towards obtaining a repeal of the tax upon spirits used for medi-cinal purposes. We are somewhat familiar with the various plans proposed for this purpose and believe none of them to be practicable. We are convinced that the result sought cannot be obtained without serious risk of entailing frauds upon the revenue derived by the United States from spirits manufactured for other purposes, and also annoyance and disgrace to the members of our profession who already suffer not a little from another phase of this question. Though they consider that the tax upon spirits used for medicinal purposes is unjust, it is a tax upon the people rather than upon druggists, and it is therefore the former who would seem to be most interested in securing its repeal.

We recommend that the Association, by resolution or otherwise, express disapproval of wholesale dealers competing in the

sale of goods with their customers.

FRANK WELLS. A. B. STEVENS. GEO. GUNDRUM.

THE PRESIDENT: Gentlemen, you have heard the reading of this report; what is your pleasure concerning it?

Mr. Wells: I move that the recommendations contained in the President's address be taken up, one after the other as they occur, and be acted upon—the recommendations which were reported by this committee.

Carried.

Mr. Wells: The first recommendation is that by-law No. 3 be amended by striking out all after the word "Secretary." The point made was that a great many individuals ask to become members who were not able to sign the constitution and by-laws, and it is not thought necessary that they should do so.

The committee also recommend that in applications hereafter to be made to the Association for membership, the blank form for application shall read as follows: "Approving of the objects of the Michigan State Pharmaceutical Association, and being desirous of becoming one of its members, I hereby make application for that purpose and signify my approval of its constitution and by-laws." That latter clause is put in so as to obviate the necessity of their signing the by-laws and the constitution, which will thereby be rendered unnecessary.

A MEMBER: I move the adoption of this recommendation.

Dr. Lyons: In regard to this proposed amendment, I will only say, that I do not think it necessary that the by-laws be altered. It is customary in other associations of this kind, where people apply to become members who are at a distance and unable to put their signatures to the constitution, simply to put their name on a slip of paper, which is transmitted to the Secretary or proper officer as their signature, and attached to the constitution. The proposition that is made in regard to the form of the application admits of carrying out this idea, the signature to that being easily transferable to the record of the signatures.

THE PRESIDENT: The by-laws read that "they shall subscribe to the constitution and by-laws before the end of the next annual meeting." I should like to hear from the Secretary.

THE SECRETARY: The point is here: We have a great many members in the upper peninsula, and it is almost impossible for them to attend the meetings. In fact, I have had quite a little correspondence with a number of those members up there in regard to that point, and they say, "If we do not attend the meeting and do not sign the constitution and by-laws, owing to that by-law, we will be dropped from the rolls." They do not want to be dropped, and still they cannot attend the meetings.

Dr. Lyons: The point I make, is, that it is unnecessary for them to be present; the slip of paper which is signed by them will be sufficient and fulfill the requirement of the by-law. That is customarily done in other associations. Mr. Stevens: I was a member of this committee and approved of this change in the by-laws; but I see from what has been said that the difficulty can be obviated by making this change in the form of the application for membership. The applicant's approval of the constitution and by-laws is thus obtained when the application is signed. If it is desirable to keep a record of the matter the application can be kept on file. The cost of printing new applications is but a trifle.

THE PRESIDENT: The question is on the adoption of this recommendation; the committee is in favor of its adoption. What is the pleasure of the Association?

The motion for the adoption of the recommendation of the committee was then put and carried unanimously.

Mr. Wells: The next recommendation is that steps be taken as soon as practicable to record the incorporation of this Assotion. This is approved; but as this cannot be accomplished before the next session of the legislature, we recommend that action be deferred until the next meeting.

We also approve the recommendation that we seek to establish friendly relations with the Associations of neighboring States by sending delegates to represent us at their meetings. I would move the adoption of this portion of the report. It would be proper, of course, if it is adopted, for the Association to take some action toward appointing such committees as are necessary.

Carried.

Mr. Wells: The committee also approve the recommendation for the appointment of a committee of five to act in conjunction with the committee of the American Pharmaceutical Association for revising and perfecting the formulary adopted by that association. I move the adoption of that portion of the report.

Carried.

MR. WELLS: The next recommendation is as follows: "While we approve the recommendation of the President that a committee be appointed to act in concert with the one appointed by the National Retail Druggists' Association, for the purpose of securing the repeal of the license tax upon druggists for the sale of distilled spirits, and also the tax upon spirits sold for medicinal purposes, we do not approve of both the objects for which this committee is expected to labor. The license tax upon druggists for the sale of distilled spirits is both unjust and degrading, and this Association should most heartily second every effort of the National Retail Druggists' Association to secure its repeal. Your committee believe these efforts should stop here and not be directed towards obtaining a repeal of the tax upon spirits used for medicinal purposes. We are somewhat familiar with the various plans proposed for this purpose and believe none of them to be practicable. We are convinced that the results sought cannot be obtained without serious risk or entailing frauds upon the revenue derived by the United States from spirits manufactured for other purposes, and also annoyance and disgrace to the members of our profession, who already suffer not a little from another phase of this question. Though they consider that the tax upon spirits used for medieinal purposes is unjust, it is a tax upon the people rather than upon druggists, and it is therefore the former who would seem to be most interested in securing its repeal."

Mr. Gundrum moved the adoption of this portion of the report.

Carried.

Mr. Wells: The committee recommends that the Association, by resolution or otherwise, express disapproval of wholesale dealers competing in the sale of goods with their customers.

The adoption of this part of the report was moved and the motion was put and carried.

MR. WELLS: It is proper now that some action be taken toward the appointing of the various committees recommended in this report, and this is probably the best time for taking that action.

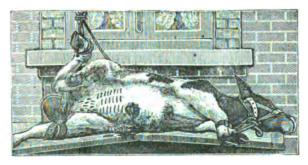
Mr. Gundrum: I move that the President appoint the committees.

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In conclusion, as this corporation, its rights and properties, are entirely owned by the President, he takes pleasure in assuring the trade that all officers are pledged to act strictly in accordance with these announcements and policy, and to so manage and direct their special trusts and our affairs as to always merit the respect and confidence of the physician, the pharmacist and the trade gener

Very truly yours.
SEABURY & JOHNSO'

GEORGE J. SEABURY, President. JOHN M. PETERS, Treasurer. ROBERT J. SEABURY, Secretary.

Mr. Gundrum's motion prevailed.

THE PRESIDENT: I will announce the committees in the morning.

The rules of the Association were then suspended to give Mr. Gundrum an opportunity to make a motion in other business.

Mr. Gundrum: I move that Mr. Allen be paid fifty dollars by the Association for the services he has rendered us. That would be a small compensation for the work he has done for us. I learn he has spent two weeks out of his store attending to the business of the Association.

Carried.

THE PRESIDENT: We will now proceed to the reading and discussion of papers.

Prof. Prescott: Dr. S. S. Garrigues has prepared a paper on "Bromine and the Saline wastes of the Saginaw Valley," which will be read by Mr. Brown of Ann Arbor.

The paper was then read by Mr. Brown.

[For paper see subsequent pages.]

Dr. GARRIGUES: I would like to say, in connection with this paper, that there is no doubt that a large number of our saline wastes have bromine in them and in quantities probably that will sometime pay for their manufacture. In this particular locality, Midland, the rock seems to descend from the Saginaw val-The depth of the sand rocks from which the brines are obtained is about 1200 feet, being about 200 feet deeper than the Saginaw valley salt rocks. It seems to me the tendency is for the rock, being lower than the others, to take up the most concentrated solutions which find their way to them. Probably the Association is aware of the three varieties of brine that we have in this State now; the brine that is found in the Palmer sandstones of the Upper Peninsula, is largely impregnated with gypsum. The brines from the Marshall sandstones, which are known as the Waverly Group, are still stronger, and the percentage of gypsum falls away with the increased quantity of the chlorides of calcium and magnesium. This is the distinguishing feature of the Saginaw brines. The new brines which are now being found by deeper borings at Manistee and

Marine City, are of an entirely different character; they penetrate the salt rock, and the solutions are made artificially, that is, by forcing a stream of fresh water to those rocks and making a solution of salt and then pumping them and evaporating the artificial brine. Of course, in all mother liquors from these solutions there will be no opportunity for finding any bromine, as it is nothing more than the solution of the pure salt; but in all brines found in localities like the Saginaw valley, only reaching a greater depth, where the tendency is to hold the stronger chlorides of calcium and magnesium, I have an impression that bromine will be found, so that parties who are located where these brines are found can anticipate the finding of bromine probably in paying quantities. Prof. Kedzie, of the Agricultural College, made an analysis of a brine found at St. Louis, in Gratiot county, showing a larger percentage of bromine than in those given in this paper, but the analyses were not given and I could not record them.

Mr. Brown: If the Association will suspend the order of business a moment, we have another batch of applications which we would like to have action taken upon.

The order of business was then suspended.

Mr. Brown: The Secretary has asked me to call the attention of the Association to one of the by-laws. Article four, of the by-laws, reads: "Every member shall pay annually in advance into the hands of the Secretary the sum of one dollar, and any one in arrears at any annual meeting shall not be entitled to vote; and any one neglecting to pay said dues for three successive years, shall forfeit his membership." There is a large number of members-I do not know whether any of them are present—but there is a large number who have not sent up their dues, and according to that by-law they will not be entitled to vote here. I will now give the names of the applicants for membership: George N. Whipple, of Detroit; Charles S. Coon, of Lisbon; Hollis T. Reed, of White Cloud; Samuel M. Reed, of White Cloud; John F. Smith, of Ypsilanti; Wellington B. McCoy, of Sault St. Marie; Charles Louis Coffin, of Detroit; E. T. Webb, of Jackson; Albert J. Wilders, of Ortonville; Charles A. Blair, of Morenci; Maitland Fordham, of Elmira; Francis Grandy, of Fairfield; George H. Graydon, of Detroit; Frank P. Glasier, of Chelsea. The applications of these gentlemen are all properly signed and a majority of the Executive Committee have examined them and recommend their election as members.

Mr. EBERBACH: I move that the report be accepted and the Secretary directed to cast the ballot of the Association for the new members.

Carried.

The Secretary cast a ballot and the applicants were declared elected.

THE PRESIDENT: While the rules are suspended we might hear from the committee appointed to report on the death of two members. •Mr. Inglis, are you ready to report on that committee?

In response to the inquiry of the President, Mr. Inglis read the following reports on the death of Mr. H. B. Parsons and Mr. E. B. Escott.

To the Michigan State Pharmaceutical Association:

Since meeting together a year ago, the Association has sustained the loss by death of our highly esteemed honorary member, Mr. Henry B. Parsons. Probably no man interested in pharmacy in our State, was more highly regarded or better known than Mr. Parsons. Born in 1855, in Asia Minor, he removed to Michigan when a mere lad. At an early age he showed a great liking and aptness for chemistry. Entering the Michigan School of Pharmacy in 1874, he graduated in 1876, in which institution he remained for two years as Instructor in Pharmacy. His career from this time until the time of his death, is well-known—always active in anything to advance the profession which he had chosen, and always ready to lend a helping hand to others choosing the same profession. Our society should feel proud of the honor of having had him for a member, and we deeply deplore his loss.

Edward B. Escott was born in Bristol, England, October 23, 1822, and came to America in 1842, settling in Detroit, where he resided until 1858. In 1858, he was married to Mary C. Daniells at Wacousta, Clinton county, and came to Grand Rapids. In 1862, he engaged in the drug business on Cana

street, near Bronson street, and later opened a branch store at No. 14, Canal street. He died Nov. 5, 1884.

In the death of Mr. Escott, our society loses one of its oldest members, he having been engaged in the drug business for twenty-three years. It is with sincere regret that we hear of his death. FRANK INGLIS,

G. M. HARWOOD, HENRY KEPHART.

Prof. Prescott: I move the adoption of the report. Carried.

Mr. Wells: I should like to propose the following change in article five of the constitution: In line three, after the word "Association," insert the words, "until the close of such meeting." The section as it now stands reads as follows: "The President, or, in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, call special meetings at the written request of twentyfive members, shall present at each meeting a report of the Association, and perform such other duties as pertain to the office." As changed, the section would read, "The President, or, in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association until the close of such meeting," etc. The object of the change is that the newly elected President of the Association shall not be installed and commence the performance of his duties until the next session after his election. It is very inconvenient for the Association to have a new President in the midst of their deliberations, who is not familiar with the work and who does not know what committees are to be appointed, and who, perhaps, does not know the kind of timber that we need on the different committees; the new President should not be installed at that critical period of our meeting. It is a great deal better for the President, who has become familiar with the work, to continue in the position until the session has closed. The new President would then have the opportunity of perfecting himself in the duties that pertain to the office. 'Under the constitution, all amendments to it have to be made in writing and lie over until the next annual meeting, and require a twothirds vote of the Association.

THE PRESIDENT: I think this is a good amendment; there will be a President elected here to-morrow, and it places such a new President in a peculiarly awkward position on the last day of the meeting. If there is no further business under the suspended rules, we will continue the reading of papers.

Prof. PRESCOTT: We will listen to a paper by Prof. O. C. Johnson, of the School of Pharmacy, being an answer to Query No. 10, "What are some of the most useful analytical tests easily made by any dispensing pharmacist, but generally neglected?"

The paper was then read by Prof. Johnson.

[For paper see subsequent pages.]

Mr. EBERBACH: This solubility of chloride of silver has come under our notice on other occasions; we had occasion to purify some sulphate of zinc of its chloride, and our plan was to take out the chloride by means of sulphate of silver; we succeeded in precipitating the chloride, but after filtering and crystalizing, we found that the crystals turned to a purple color, indicating the presence of chloride. There were no means of causing that chloride to settle into the precipitate except by a large dilution. I suppose that is conclusive evidence that chloride of silver is also soluble in some other solutions, to some extent.

Prof. PRESCOTT: Mr. A. B. Stevens, of Detroit, will now read a paper in answer to Query No. 17, "How much is gained by preparing a solution of citrate of magnesium, instead of obtaining it of the manufacturer? What is the quality of the article furnished by manufacturers?"

The paper was then read by Mr. Stevens.

[For paper see subsequent pages.]

Mr. Brown: I notice on our program for to-day, that there is a special matter of trade interests that has not been touched upon at all yet.

THE PRESIDENT: The report of the Committee on Trade Interests was called for, but there was no committee here; if the report is here now, there is no objection to hearing it.

Mr. Brown: The report was sent in by Mr. John J. Dodds, chairman of the committee, this morning, with the request that Mr. Parkill read it to the Association.

Mr. Parkill then read the report of the Committee on Trade Interests as follows:

REPORT OF COMMITTEE ON TRADE INTERESTS.

Mr. President and Gentlemen:

In offering this report, your committee deem it advisable to remark, that they have experienced some difficulty in selecting from a subject so wide and indefinite, some objects which appeal forcibly to all, or at least a majority, of those engaged in our profession. Such as we present, however, appear to call for prompt attention, and if consistently carried out, will certainly work greatly to the benefit of the retail druggists of Michigan.

Certainly one of the most important of trade interests is the question of the prevention of "cutting" prices; the attempt to control the retail prices of patent medicines by the so-called "Campion Plan," which at one time bid fair to afford a measure of relief, has since our last meeting completely failed of its object; and the experiment has demonstrated the impracticability of any scheme of this character, however willing both proprietors and jobbers may be to co-operate in carrying out its provisions, so long as there remains so pronounced a division on the subject in the ranks of the retail trade.

The remedy we propose, is that of local organization. Let every member of the Michigan State Pharmaceutical Association constitute himself a missionary to spread the gospel and sow the seed of unity; when you return to your homes on the adjournment of this meeting, take with you a determination to throw aside any prejudice existing in your minds against your competitor in business, and proceed to make a neighbor of him in the true sense of the word, rather than a foe. When this has been accomplished, the question of "cut" prices can be readily solved by the adoption of a local agreement to maintain regular rates. No doubt many are skeptical about the feasibility of this plan, but the success which has attended its thorough application in cities and towns where it has been tried, proves conclusively that it can be carried to a satisfactory result, when the trade takes the matter in hand with a determination to achieve success.

Another important and constantly growing burden to the druggist is the custom of many physicians who prescribe some

particular manufacturer's preparations, taking the question of judgment and selection entirely out of the hands of the pharmacist, and reducing him to a mere vendor of "Jones's" fluid extract, "Brown's" clixirs and "Smith's" pills. This practice becomes especially grievous to the druggist in the larger cities, to. whom are presented the prescriptions of so large a number of physicians, each, perhaps, with a preference for a different manufacturer's preparations, thereby necessitating the carrying in stock of an endless duplication of the same article under different labels. Your committee therefore recommend, that some action be taken by this Association whereby the physicians of our state at least, may be brought to understand that when they prescribe an official preparation they should append no further qualification, but leave the pharmacist to dispense his own cr any other manufacture which he may consider entirely reliable; certainly this much confidence should be felt by the prescriber before sending his patient to the dispenser.

Your committee would further call the attention of the trade to the desirability of shortening the time during which drug stores are kept open for business. In no other branch of legitimate trade are so many hours' work required; while in cities of 25,000 inhabitants or over there may be some excuse for the practice, particularly when the dealer depends largely on his cigar and tobacco trade, in the smaller towns there exists no necessity for it. There is no reason why a drug store should not be closed as early as a grocery or a baker's shop. When the customers learn that the druggist closes with his neighbors in other lines of business, they will secure their supplies earlier; of course the druggist, as the doctor, is a "minute man," whose term of enlistment expires only with his retirement from business, and he must be ready to supply medicines in cases of emergency at all hours; but calls of this nature can be as easily attended to between nine o'clock and midnight as they are now

between midnight and seven in the morning.

We wish also to commend to you the closing of stores on the Sabbath, for at least a portion of the day. The druggist is just as much entitled to his one day in seven for rest, as is his neighbor who measures ribbons or counts eggs, and concerted action on the part of proprietors will soon give it to him. If any desire to know how these suggestions work in actual practice we refer you to the druggists of Traverse City, where they close at 7:30 in winter, and 8:30 to 9 o'clock in summer.

Possibly you may think that these are too great undertakings to attempt, but we must bear in mind that this Association was organized to bring about needed reforms, great and small, and the success attending our efforts to secure a State

pharmacy law, proves that there is nothing in the direction of reform in the interests of trade from which we need shrink, either from the difficulties which present themselves or the labors involved.

Let us, therefore, fearlessly and resolutely press forward in our endeavors, until the desired object has been accomplished. Respectfully submitted.

JOHN J. DODDS.

Chairman of Committee on Trade Interests.

Mr. Eberbach: I move the adoption of the report.

Mr. Bassett: It seems to me this paper ought to elicit some discussion. I would like to hear from some of the members present. It strikes me that this point of agreeing to regulate prices in some of the smaller towns might work very successfully. It is sometime since I have been through the State very much to know whether the general stores in the smaller places handle our goods or not; but here in Detroit the grocery trade sell heavy drugs like saltpetre, salts, senna, &c., and they have got to that point that they sell most of the proprietary and toilet articles, and the dry goods stores are doing the same thing. Now, I would like to have a remedy for this state of affairs. I think we can handle the drug stores of Detroit very well. There are something like a hundred retail druggists here. Some time since in our city Association we appointed a committee to call upon some of the leading houses here that handled our goods, and that committee made one or two calls and came back discouraged. I wish this Association would bolster us up, to see whether anything can be done with the trade outside of the druggists.

THE PRESIDENT: I suggest that you do as they did in Grand Rapids—appoint a committee that got the names of every druggist in the city and every man that handled medicines, whether grocerymen, or dry-goods men, and then act in concert. They have one of the most successful societies in that regard in Grand Rapids that I know of.

Mr. Vernor, of Detroit: Do you think the Grand Rapids committee would make a success of it in Detroit?

THE PRESIDENT: I think they would; they are wonderful boys and they are red-hot.

Mr. VERNOR: It would be worth while to pay their expenses to get them to come and try it.

Mr. Bassett: One of our leading houses here spent more money in one week in advertising than all the druggists in the city in six months, and told us that if we did not keep still they would take the whole list of toilet and proprietary articles and advertise them at cost. They are now advertising a large lot of goods at cost or so near cost that the transportation only is added.

THE PRESIDENT: We will now return to the reading and discussion of papers.

Prof. Prescott: One of the objects and undertakings of this Association has been to do something towards correcting the standards and tests of the United States Pharmacopæia, or providing means for doing so. We flattered ourselves last year that something was done, and query No. 5 is to the same effect: "The United States Pharmacopæia fixes the strength of the tincture of nux vomica by the amount of extracted matter it contains; to what extent does this secure uniformity in the product?" Accepted by Dr. Lyons.

The paper was presented by Dr. Lyons, (see subsequent pages) who spoke as follows concerning it:

Dr. Lyons: The general subject has been very completely discussed by two gentlemen in England within the last two years (Messrs. Dunstan and Short,) under the auspices of the British Conference. They have made a complete series of experiments, both on the drug nux vomica and on the preparations of it, and they have proposed to the British conference a tincture and the solid extract of nux vomica of established strength. Of course, in a matter of this kind, there is little left to do but to gather the results of their work, but to their work I have added a good many observations that it has come in my way to make myself, for the most part corroborating their observations.

You understand that the present pharmacopæia requires that tincture of nux vomica contain two per cent. by weight of extractive. Formerly a certain amount of nux vomica was extracted by boiling with alcohol, using a certain proportion of drug to produce a certain volume of tincture. There were various difficulties in that process, arising partly from the difficulty in any case of extracting nux vomica, but largely from the attempt to make so strong a tincture. In the new pharmacopæia, the strength of the tincture is greatly reduced, and the standard strength is now made to depend on the quantity of extractive matter.

The result of the examinations made in England briefly were as follows: Tincture of nux vomica, made in accordance with the formula of the British pharmacopæia, contained a proportion of alkaloids varying from about one-tenth to about three-tenths of one per cent., a variation in the rate of one to three. This is what we might expect, because it is almost impossible with a drug like nux vomica to secure anything like uniformity in the grade of powder used in a small way by retail dealers in making this tincture, to say nothing of other reasons.

Admitting, in view of the evidence furnished by these assays that it is very difficult to make the tineture at all uniform practically, does the difficulty lie in the drug? The result of assays shows that nux vomica contains an average of about three per cent of total alkaloids. I will not give exact figures; we will say two and a half to three and a half per cent., with an average of three. But the drug itself does vary actually as much as that, nearly in the proportion of two to three, so that if the drug could be completely exhausted we should have as much variation as that in the product.

The next question, however, bearing upon this topic is, does the extractive matter in this tincture contain anything like a uniform quantity of alkaloid? I have collected from the researches of Dunstan and Short, from a good many analyses made by several other observers, and a still larger number that I have made myself, some sixty-six assays altogether, data showing, that the proportion of alkaloid in the dry extract, the same menstruum being used and exhausting the drug is from fourteen per cent. to as high as 24 per cent. of alkaloids. Of course, we shall have from a preparation standardized on the solid extract

a corresponding range in strength, assuming that the total alkaloid is a proper basis for estimation.

I have undertaken to examine the question whether it is possible to reduce this variation in the quantity of alkaloid in extractive by attention to the menstruum used. By collating the results obtained by several observers I came to this conclusion, that where the menstruum is strong alcohol or anything approaching strong alcohol, the strength of the extract—the amount of alkaloid in the extract—is liable to great variations. Here are a few of the results which I can give briefly, in which different menstrua were used; fifty per cent. spirit gave an extract containing sixteen per cent. of alkaloids. Sixty-six per cent. alcohol gave an extract containing nineteen per cent. of alkaloids, which was the highest figure obtained. Seventy-five per cent. alcohol gave fifteen per cent. of alkaloids. An alcohol the strength of the menstruum of the pharmacopæia gives a product containing eighteen per cent., showing a sudden and great increase, while a stronger menstruum than this, ranging between ninety and 100 per cent. by volume of common alcohol gives a range of eighteen to ten per cent. of alkaloids in the extract. Now, there is no such variation where the menstruum is much weaker than this. If a menstruum is taken containing twothirds or three-quarters alcohol, instead of nine-tenths, you may expect to get an extract which contains from fourteen and a half to perhaps sixteen or seventeen per cent. of alkaloids, but without a much greater variation than that in strength; so that if the general method of the pharmacopæia is to be adopted still. we should change the menstruum using one much weaker, in order to secure greater uniformity.

Another question has, however, arisen in England. I do not know as yet whether the propositions of Messrs, Dunstan and Short have been adopted in the new British Pharmacopœia standardizing the tineture and solid extract of nux vomica; it is probable that they have, and now the question that arises is, will a standard based upon total alkaloid secure a much greater uniformity in these products than one based upon extractive? The nux vomica contains two alkaloids—strychnine and bru-

cine; the relative strength of these is variously stated; brucine is not more than one-fifth the strength of strychnine; the highest statement is one-third; we may say one-fifth; some say not more than one-ninth the strength of strychnine; some say pure brucine has hardly any effect at all; at all events, there is a very great difference. Is the proportion of strychnine in the total alkaloids about the same in all cases? I have a number of figures, the results of analyses by Dunstan and Short, which would go to show a range between one-third and one-half of total alkaloids as strychnine. If we give to brucine the value of one-fifth of that of strychnine we shall still have a ratio of about three to four between the total alkaloid in one case, where the proportion of strychnine is small, and another where it is large; but even with these figures it would be a very decided improvement over the process of the pharmacopæia to adopt total alkaloids in place of extractive as the basis on which to standardize this tineture. The process of making the assay is not more difficult than that given by the pharmacopæia. The pharmacopæia simply evaporates to dryness so as to determine the total extract; but there is no difficulty at all in extracting total alkaloids from the extract itself by processes which I give in detail in my paper, but which are among the simplest possible operations in chemistry, certainly not more difficult than many pharmaceutical operations.

As the result of all these considerations, my recommendation would be to a subsequent committee on revision of the pharmacopæia, aiming at making the standard practically what it is now, to substitute for total extract the proportion of total alkaloids contained in the product. I am very partial myself to maintaining a standard of measure rather than of weight for all fluid preparations. I should recommend, instead of three-tenths per cent. of total alkaloids in the product, to make the product contain, as Dunstan and Short do, so much total alkaloid in each fluid ounce; but in this I shall not probably have the support of the Committee on Revision; but I shall make a strong effort of my own in this direction, and shall endeavor to have it supported by others. I know that the late lamented Henry B. Parsons held similar views, and in the last conversation I

had with him urged the necessity of agitating this question through the journals during the next four years, endeavoring, if possible, to restore our standard of liquid pharmaceutical preparations to a basis of volumetric strength rather than of gravimetric strength. I cannot dwell upon the reasons here, but they appeal to every one who dispenses, and certainly to every one who prescribes medicines; the doses are taken by the teaspoonful, not by weight; it will be many years before the patient will have scales in his house to weigh his doses.

Prof. Prescort: The hour for adjournment has arrived. I would like, for the information of the Association, to read Query No. 3, "How can the pharmacist best avoid the disadvantages of a demand for the numerous brands of fluid extracts?" Accepted by C. S. Burroughs, of Clinton.

MR. WELLS: I think most of us would like to hear that paper.

Mr. Gundrum: I move that we have the reading of papers for the next half hour without discussion.

Carried.

THE PRESIDENT: If the members will be seated we will hear the papers.

The paper by Mr. C. S. Burroughs was then read by Mr. Brown.

[For paper see subsequent pages.]

Prof. PRESCOTT: Query No. 30, "To what extent does the precipitated sulphur of the market contain a large proportion of sulphate of calcium?" will be answered by Wm. A. Hall, of Greenville.

The paper was then read.

[For paper see subsequent pages.]

Prof. Prescott: In answer to Query No. 24, "How nearly does the tineture of iodine in use conform to the pharmacopæial standard of strengths," I submit a paper, which can be consulted at length in the printed proceedings.

[For paper see subsequent pages.]

Prof. Prescott: There are several papers contributed by Dr. Lyons which will enrich the proceedings, and some of which

I will now mention by title: "Experimental determinations of the coefficient of expansion by heat of officinal liquids, particularly of solutions, dilute acids, etc," being Query No. 31. This very week I got a letter from Indiana from a chemist and pharmacist there, who asked me if I could cite him anywhere to such tables as would enable him to correct the specific gravity found at one temperature so that it would give the specific gravity at the standard temperature; he said he was surprised not to be able to find tables of correction for temperature in the case of specific liquids. That subject is taken up in the paper of Dr. Lyons, which can be consulted in the proceedings when printed. I will thank Dr. Lyons to give the names of his other papers.

Dr. Lyons: One paper on the assaying of ipecac is the only one of importance aside from the one named.

Prof. Prescott: Three other papers have been contributed by the School of Pharmacy at Ann Arbor. A paper on the proximate analysis of a plant, by Mr. Henry Palmer; a paper on the examination of certain volatile oils, contributed by Mr. A. E. Melcher, and a paper on the aromatic spirit of ammonia, as prepared by different processes and methods, which was submitted by Miss A. Gertrude Flanders, at the School of Pharmacy, with examples prepared according to the different processes. This concludes the list of papers submitted in response to queries.

[For the above mentioned papers see subsequent pages.]

THE SECRETARY: We have another batch of applications for membership. We have the names of Charles Moorland, of Hadley; Charles E. McLean, of Jackson; Jerome F. Pease, of Detroit; Dennison D. Brown, of Kalamazoo; Andrew W. Seed, of Cass City, and George Ticknor, of Wyandotte; all of whom are properly recommended, and the committee recommend their election.

Mr. Gundrum: I move the adoption of the report of the Executive Committee, and that the Secretary cast a ballot for the Association.

Carried.

The Secretary cast a ballot and the candidates were declared elected.

Mr. DUPONT, of Detroit: We have with us to-day the father of the Pharmacy bill passed last winter, Dr. Hueston, and I would like to hear him address this meeting.

Dr. Hueston was then called to the platform by the President and was received by the Association with every manifestation of approval.

Dr. Hueston: Gentlemen of the Pharmaceutical Association of the State of Michigan. I am proud to be with you. I consider it to be a great honor to be called upon to speak a few words to you.

Though not a pharmacist, for the last few months I have been deeply interested with you, and although I am not a public speaker I did learn something of public speaking in trying to pass the Pharmacy bill.

When I was first elected to represent the people in the Senate I saw that there were inconsistencies as between the professions and the people. I never could see exactly the consistency of the representatives of the people taxing the people to support the scientific studies and at the same time not protecting them, and I found when working to correct these errors that there seemed to be other inconsistencies. I found that it was very easy to pass a law that harm should not come to a mule, or to save a twenty-five dollar calf or a fifty dollar colt, while the bill to keep small-pox from our families was reported unfavorably and laid on the table four times before it was passed. In the best way I could, with many of your brethren and representatives I attempted to get laws through the legislature that would make you a legal, scientific body, and also that the dentists should be recognized as a scientific body, as the people were taxed to educate them; that the medical profession should be looked after also, but while I did that I kept in view the idea that I was not working for the pharmacists; that I was not working for the dentists, that I was not working for the physician, but for the benefit of the people, and as we shall progress in this thing and the pharmacist shall be more thoroughly and universally educated to his business, there will be less trouble than there has been and more confidence in him among the people and physicians.

It has been remarked here in an essay that there was a struggle between the physician and the pharmacist, and between the retail pharmacist and the wholesale dealer. I think that has come about by the loose methods in which the business has been carried on, until the physicians all through the country, myself among the number, have lost faith in the general phar-This has arisen from the fact that we could not write macist. a prescription and send it to the druggist with any confidence that it would be put up by a competent person. And so I have heard all over the State from different physicians the general expression that unless the druggists can be relied upon to put up a prescription rightly we will buy our drugs from the manufacturer. And this has been the case. They have bought their drugs from the manufacturer and put them up in very many cases where they would not have done it if the druggist had employed some one who was competent to put up the drugs. It is but a few weeks ago that I wrote a prescription containing aconite to be given to a child. I made it very light; the boy was pouring it in to the bottle and I said to him, "See here, do you pour that in ?" He says, "Yes, it ain't but a little, it don't do any hurt." I said, "Let us see how much it is," and we dropped it out until we found that a child of six years was going to take two drops of the tineture every half hour. Now, we would have had a dead child and a condemned druggist. Under the new law there will be more men who will be careful how they mix their drugs. There will be more men who know how nitro-glycerine is manufactured; more men who will know the difference between potent remedies and those of a more harmless nature.

I believe that in all my legislation there is nothing of which I feel so proud, that I shall remember with so much gratification, as my efforts made in connection with my friends of the profession and my colleagues in the legislature as the part I have taken toward bringing up the standard of the profession. And I believe, now, that if you gentlemen go forward and let the people feel you are working for their interest, as I believe you are, there will be no more trouble in the matter of legislation, no more trouble in getting people to see the necessity of

I did not anticipate speaking to you at this time and will say but a word further. I hope you will go forward as you have begun and then the confidence of the people will be increased. If the people could see you as I see you to-day, not combining together to raise the price of prescriptions, but to elevate your profession they would be satisfied as I am that you are engaged in a noble work; they would find that you are engaged in an effort to raise the standard of your profession and to better qualify yourselves to do your duty to the people.

THE PRESIDENT: Gentlemen, I do not think there is a man in the state that it would give me more pleasure to invite to a seat upon this stage than Dr. Hueston. If there is a friend to the pharmacists in the state it is Dr. Hueston. He was our friend during last winter and worked to his utmost to procure the passage of our bill, and I am glad to have him upon the platform.

Mr. Jesson: I move that a vote of thanks be tendered to Dr. Hueston on behalf of this Association for his work performed for us last winter in procuring the passage of our bill, and I desire that that vote shall be a rising one.

The motion was carried unanimously.

Dr. Hueston: I assure you gentlemen that I receive this vote with feelings of great emotion. At the same time accept my thanks for the honor you have conferred upon me.

Mr. Stevens: Before we adjourn I would state that the Executive Committee desire to submit the names of five more applicants for membership which the committee desire shall be acted upon now. We submit the names of G. S. Purvis, of Detroit, James L. Kellogg, of East Saginaw, Thomas Morrison, of Wayne, G. A. Swaby, of West Bay City, James W. Brown, of Detroit.

The Secretary was directed to cast the ballot of the Association and the applicants were duly elected.

On motion of Mr. Gundrum the Association adjourned until Thursday morning.

FIFTH SESSION.

THURSDAY, OCTOBER 15-9 O'CLOCK, A. M.

The Association was called to order by the President, who announced the following committees and delegates:

COMMITTEE ON \$25.00 LIQUOR LICENSE.

Mr. Jacob Jesson, of Muskegon.

Mr. S. E. Parkill, of Owosso.

Mr. G. M. Harwood, of Petoskey.

COMMITTEE ON FORMULARY.

Prof. A. B. Prescott, of Ann Arbor.

Dr. A. B. Lyons, of Detroit.

Mr. O. Eberbach, of Ann Arbor.

Mr. F. J. Wurzburg, of Grand Rapids.

Mr. Frank Inglis, of Detroit.

DELEGATES TO WISCONSIN STATE PHARMACEUTICAL ASSOCIATION.

Mr. James L. Kellogg, of East Saginaw. Mr. O. P. Safford, of Flint.

Mr. Frank Hibbard, of Evart.

DELEGATES TO INDIANA STATE PHARMACEUTICAL ASSOCIATION.

Mr. George Gundrum, of Ionia.

Mr. G. L. Davis, of Lansing.

Dr. C. P. Parkill, of Owosso.

DELEGATES TO OHIO STATE PHARMACEUTICAL ASSOCIATION.

Mr. Frank Inglis, of Detroit.

Mr. A. W. Allen, of Detroit.

Mr. Clarence A. Fellows, of Big Rapids.

DELEGATES TO ILLINOIS STATE PHARMACEUTICAL ASSOCIATION.

Mr. Jacob Jesson, of Muskegon.

Mr. Henry Kephart, of Berrien Springs.

Mr. A. H. Lyman, of Manistee.

THE PRESIDENT: The first business is the election of officers for the ensuing year.

On motion of Mr. Bassett, the election was postponed until ten o'clock.

The Committee on Exhibits, through the Chairman, Mr. Caldwell, of Detroit, then submitted their report as follows:

REPORT OF COMMITTEE ON EXHIBITS.

To the President and Members of the Michigan State Pharmaceutical Association:

Your Committee on Exhibits would respectfully report, that after making as careful an examination as was possible in the short time we had this morning, we find that the exhibit is up to the standard of last year, and in point of numbers exceeds it by fifteen.

The following is a list of the exhibits:

McKesson & Robbins, New York, gelatine coated pills, cinchona bark alkaloids, sulph. morphia, cocaine—alkaloid, hydrochlorate, hydrobromate, citrate and cleate.

John Wyeth & Brother, Philadelphia, compressed medicinal

lozenges, liquid malt extract, and wine of coca.

Frederick Stearns & Co., Detroit, very handsome display of gelatine coated pills, fluid extracts, fruit tablets, perfumery, pharmaceutical products and non-secret remedies.

Seabury & Johnson, New York, fine display of medicinal plas-

ters, absorbent cotton, lint and antiseptic preparations.

Doliber, Goodale & Co., Boston, Mellin's Food for Infants. Hops and Malt Bitters Co., Detroit, hops and malt bitters.

Trommer Extract of Malt Co., Fremont, O., extract of malt bottled and in bulk, in one, two, three and five gallons swing cans.

Sherwin, Williams & Co., Cleveland, paints and colors.

Geo. Swift, Detroit, representing manufacturers: Trustlow & Co., New York, Corks; Whitney Glass Works, New York and Philadelphia; Wayne Perfect Tooth Brush; Hall's Health Syringe, and many other specialties.

Henry F. Miller, Baltimore, Md., very large and fine display

of druggists' tinware.

Vail Bros., Philadelphia, ideal tooth powder.

The Randolph Paper Box Co., Richmond, Va., very fine and

full display of paper boxes, labeled and plain.

The Irondequoit Wine Co., Rochester, N. Y., sherry and catawba wines.

James E. Davis & Co., Detroit, a very handsome and fine display of holiday goods, cut glass ware, toilet cases, &c., which was much admired by every one.

Eastman Bros., Philadelphia, very fine display of soaps and

perfumery.

G. F. Burton, Springfield, Ohio, percolating and filtering apparatus, carboy pump and syphon starter.

Simons & Cooper, Detroit, Cooper's compound glycerine

lotion.

Chesebrough Manufacturing Co., New York, full line of vaseline preparations.

L. Black & Co., Detroit, optical and mathematical instruments.

A. Major, New York, cements.

Charles Wright & Co., Detroit, a very large and fine display

of pharmaceutical preparations and non-secret remedies.

Farrand, Williams & Co., Detroit, a very interesting exhibit of crude drugs, and their preparations; pharmaceutical products and chemicals of their own manufacture.

Burrough Bros., Manufacturing Co., medicinal fluid extracts

of fine appearance.

Detroit Linseed Oil Co., oil and oil meal.

Berry Bros., Detroit, varnish gums and hard oil finish.

McKenna Art Sectional Sign Co., handsome signs.

Knickerbocker Brace Co., Easton, Pa., shoulder braces.

The Acme White Lead and Color Works, Detroit, white leads in oil and colors, carriage paints.

Egan Imperial Truss Co., Ann Arbor, trusses.

A. B. Saltzer, Detroit, Wright Bros. Pond Lily toilet wash. David Nicholson, St. Louis, Mo., liquid bread, Cook's Imperial champagne, and American Wine Co's products.

The Duroy Wine Co., Cleveland, fine port, sherry and Ca-

tawba wines.

H. D. Cushman, Three Rivers, Mich., Menthol Inhaler.
Milburn & Williamson, Detroit, surgical instruments and supplies.

A. J. Kelly, Ann Arbor, Mich., The Peerless Truss.

R. R. Lansing, Detroit, white enamel letters and mica labels. Burk, Rich & Co., Detroit, fine display of cigars and leaf tobacco.

Whitall, Tatum & Co., Philadelphia, a fine display of glass-

ware and sundries.

The Detroit Paper Co., Detroit, wall paper and window shades. Eugene Ross & Co., Detroit & Windsor, proprietary medicines. Union Plaster Co., New York and Detroit, medicinal plasters. Coffin & Wood Chall Detroit, Detroit, Menthol crystals.

Sheely & McDonald, Detroit, handsome Japanese decoration.

W. E. SHORT,
JAMES W. CALDWELL,
O. B. DICKINSON,
F. H. ESCOTT,

W. H. PECK, Committee.

On motion of Mr. Parker, of Detroit, the report of the committee was accepted.

Mr. Wells: While we are on this subject of exhibits, there is one question I would like to ask, and that is, whether the expense of the room for the exhibits is paid for by the Association or not? If there is any one in the room who can inform the Association, I wish they would do so.

Mr. Stevens: This subject was brought up at a meeting of the Executive Committee, and we decided that it was not best to charge exhibitors for space. The society is young yet and we all knew that the exhibits were a source of great interest to the members and that it helped to bring people here; we therefore did not think it advisable to charge for space at present at least. For that reason we decided we would hire rooms outside of the hall and give them the rooms free. The same action was taken by the Executive Committee in Detroit last year.

MR. WELLS: I think the action of the Executive Committee was right and proper during the infancy of the Association, but I think we may safely conclude that we have now arrived at an age when we shall not require any extra effort of this kind, and therefore, to test the sense of this Association in regard to this question, I move that hereafter this Association will not be held responsible for space furnished to exhibitors.

Mr. GUNDRUM: I second the motion.

Mr. Verner, of Detroit: I would like to move as an amendment, that the space be furnished by the local Association of the town in which we meet. There is no doubt that this is a very interesting part of the meeting, and I should dislike very much to see it done away with. That matter should be left to the Local Secretary of the Association of the town in which we meet and he should be responsible for it.

Mr. STEVENS: I do not think it is right that the local association should pay for it; I think it is better that the Local Secretary should make a charge and collect the amount from the exhibitors.

Mr. Wells: The object of my motion is simply this, that the exhibitors shall pay the whole expense of the rooms they occupy, and I hope the amendment of Mr. Vernor will not prevail.

Mr. Gundrum: It is my opinion that it would be well for the Local Secretary not to rent any hall or building until he is satisfied that the expense will be paid by the exhibitors. I was one of the Executive Committee that approved the renting of the room this year, and not charging exhibitors for space, and I do not like to find fault with my own committee, but I believe it will be wise in the Association to be more cautious in their money matters; if it is to be done at all let the Local Secretary first canvass to see how much room will be wanted and whether it will pay to rent any room. I do not think it would be right to entail expense on local associations. If I understand the amendment right that was the purport of it.

Mr. Vernor: The expense would be upon the entertaining committee wherever we go. They will get it from the persons residing in the city where it is held, but the exhibitors themselves will contribute.

The amendment was then put and lost.

The question then arose on the adoption of the original resolution which prevailed.

Mr. JESSON: I think it would be in order at the present time to present a matter I have here to the Association.

Resolved, That the Grand Rapids Pharmaceutical Society hereby extend an earnest and cordial invitation to the Michigan State Pharmaceutical Association, to hold their annual meeting for 1886, in Grand Rapids, and that we shall feel it an honor and a pleasure to entertain our brothers of the profession at that time.

(Signed,) FRANK H. ESCOTT, Secretary.

I move the invitation be accepted.

Carried.

Mr. JESSON: I nominate Mr. Will White, of Grand Rapids, as Local Secretary.

Mr. White was duly elected.

Mr. Stevens moved that the rules be suspended to permit the Executive Committee to report the names of additional applicants.

The motion prevailed, the Chair declared the rules suspended and the committee reported the following additional names: Charles S. Andrus, of Detroit; Alvin E. Holt, of Detroit; W. H. Prettie, of Detroit; H. F. McGraw, of Detroit.

The Secretary was directed to cast a ballot for the Association and the applicants were declared elected.

Mr. JESSON: Mr. President, the duty has been performed and it makes our membership an even 694 names.

Prof. Prescott: I would report that an answer to another query, or rather a volunteer paper, was overlooked yesterday, "An Analysis of certain Cosmetics," by Frank A. Clark, which I beg to submit, reading it by title.

THE PRESIDENT: You have heard the reading of the paper by title. The paper will take the regular course and be printed in the proceedings.

Mr. Wells: We have reached the hour for the election of officers.

THE PRESIDENT: The special order is called for.

Mr. Wells moved that a further delay be had and that the hour for the election of officers be postponed for fifteen minutes. Carried.

Mr. Stevens: If there is no other business, I would like to state that when the delegates from the National Retail Druggists' Association reported yesterday, I was in hopes there would be some discussion or remarks in favor of that Association. There are a number who have joined that Association who have not paid in their yearly dues, and for that reason they appointed men who were selected by the delegates from different places to collect these arrears. Mr. Houp, of Detroit, was appointed to look after the matter here, and also obtain new members if he could. What they most need is membership to give strength to the Association. A national organization of that kind with only a few members, carries but little weight, and if they are to make an effort at Washington to have this special tax removed, they want an additional membership in order to give force to what they say. We have in our own state society a

membership of about 700. I do not know the percentage belonging to the National Retail Druggists' Association, but it is very small. It only costs one dollar, and it seems to me we can afford to keep up an organization of this kind. Suppose they should have the tax removed? That would mean twenty-five dollars a year for every druggist. The membership fee is a very small thing, but it would give them support. I would like to hear some discussion upon this question.

Mr. Bassett, of Detroit: I should like to have heard in the report of the delegates something in regard to the necessity of this Association. They gave us a report here yesterday of how they got there, what a good time they had, &c., but I have failed as yet to find out what this Association is organized for, what their purposes are and what they wish to accomplish. I would like to have Mr. Stevens give us some idea of their plan of work.

Mr. Stevens: The gentleman will remember that the Campion plan was a matter which that association persistently urged, and he will remember that he threw cold water on that plan last year, and I presume that he would like to throw cold water on that Association. They have given their money and time to forward the interests of the druggists, and if they were supported by the whole country as they should have been the Campion plan would never have fallen through, from the fact they have so few members it did not carry the weight it ought to have carried. The organization was calculated to look after the interests of the druggists; the Campion plan was not the only thing they were working for. Their business is to take up anything that is of importance to the druggists of the United States. Of course, after the failure of the Campion plan, there was not much for them to do last year. tax however, is one of the things they propose to act upon. It was proposed there to try and induce societies to join them in a body but they thought it could not be done, and so they appointed different persons to represent them at the different meetings. We have men in that Association who have worked hard, and it seems to me if we can induce others to join them it would result in giving them a strong organization and we

should find something would be done; instead of throwing cold water on the organization, we had better chip in our little dollar and support it.

Mr. Bassett: I don't know that it is to be necessarily inferred if a man ask a question for information that he is throwing cold water on, or attempting to injure any plan. If you will turn to the proceedings of the last meeting you will find I asked for information in regard to the Campion plan, because there was not a man who had anything to do with the plan who was more anxious for its success than I was. I am willing to support the National Druggists' Association, but I want to knew what they intend to accomplish and then I know what I can do.

Mr. Stevens: I have not the time to read the record through; any one can refer to it and I would like to have them do so.

Mr. BASSETT: What is that?

Mr. Stevens: In regard to your remarks last year.

Mr. Bassett: In making the motion I used these words, "the Campion plan is a failure," and I said I did it simply for the purpose of getting the views of the members of the Association in regard to the working of the plan.

THE PRESIDENT: Mr. Bassett is right.

Mr. Bassett: I think the subsequent history of the Campion plan illustrates the idea that it is well to know what you are going to do before you commence.

THE PRESIDENT: I think this Association ought to be supported by the druggists generally. If it was properly supported it would be to the advantage of druggists all over the country. If there is no other business to come before the Association the special order will be called.

Mr. Wells: I move we proceed to the election of President. Carried.

Mr. Dupont: It will be necessary for us to have some tellers. The President: I will appoint as tellers, Mr. Dupont, Mr. Frank Inglis, Mr. Frank Escott and Mr. G. M. Harwood.

Mr. Bassett: I have been requested to present to this Association a candidate for the Presidency. I assure you it gives

me great pleasure to do so, from the fact that he was one of the original supporters and one of the charter members of this organization; a gentleman who has taken a deep interest in the organization from the day it was started; one who has held an official position in the Association which has required care and attention. He has fulfilled the duties of that office in a very satisfactory manner, and he is, in my opinion, eminently capable of filling the position of President of this Association in a manner that will reflect credit upon us. He will be, if elected, a worthy successor to those who have preceded him. I have the honor to present the name of H. J. Brown, of Ann Arbor.

The ballot being taken, resulted in the election of Mr. Brown.

Mr. Brown being called upon, said:

I take occasion to thank the Association for the honor they have conferred upon me. I think there is no way in which I can better manifest my gratitude than by refraining from making any extended remarks at this time.

On motion of Mr. Wurzburg, the election of Mr. Brown was made unanimous.

The following Vice-Presidents were then elected:

Mr. Frank J. Wurzburg, of Grand Rapids.

Mr. A. B. Stevens, of Detroit.

Mr. Frank Inglis, of Detroit.

For the office of Secretary, Mr. Wells nominated Mr. Jesson for re-election.

Mr. Jesson: It is certainly a great honor that you offer to confer upon me by again electing me your Secretary, but this time I cannot accept a re-election. There is such a thing as having too many irons in the fire, and I am in that condition just at the present time. I have reached this conclusion after mature deliberation. The Secretaryship of this organization and the secretaryship of the Board of Pharmacy of the state, should not be in the same hands. Having accepted the secretaryship of the State Board of Pharmacy, I feel it a duty to myself and to the Association to vacate this office and let you turn it over to some one else.

In leaving it I desire to express my gratitude to the members for their uniform kindness extended to me as Secretary, and I assure you that as a member of the Association, I shall always use my endeavors to elevate the retail drug trade of this state. This is final.

The motion nominating Mr. Jesson was withdrawn by consent.

Mr. Jesson: I am desirous as are all members, of having this office turned over to good hands, and I would nominate Mr. S. E. Parkill, of Owosso, for the office of Secretary.

Mr. Frank Inglis nominated Mr. A. Allen, of Detroit.

A delegate moved that a recess of five minutes be taken which was lost.

Mr. Parkill having received the highest number of votes, Mr. Stevens, of Detroit, moved that the election be unanimous.

Carried.

Mr. Gundrum: I nominate Mr. Wm. Dupont of Detroit, as Treasurer.

There being no other nomination for the office, the Secretary was directed to cast the ballot of the Association for Mr. Dupont, and he was declared unanimously elected.

Mr. WURZBURG: I would submit for the consideration of the Association, a change of the time of meeting, and I move that when this Association adjourns, it shall adjourn to meet on the first Tuesday in October, 1886.

Prof. Prescott: I would suggest that it would be somewhat inconvenient for the Ann Arbor members connected with the school to have the time of meeting fixed for the first week in October, as it is the week of opening. I don't claim this is a very important consideration, but still to get the sense of the meeting I would propose as an amendment, the second Tuesday instead of the first.

The amendment prevailed.

The following delegates were then elected:

DELEGATES TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Prof. A. B. Prescott, of Ann Arbor. Mr. A. B. Stevens, of Detroit. Mr. O. Eberbach, of Ann Arbor.

Dr. A. B. Lyons, of Detroit.

Mr. H. J. Brown, of Ann Arbor.

ALTERNATES TO AMERICAN PHARMACEUTICAL ASSOCIATION.

Mr. George McDonald, of Kalamazoo.

Mr. Wm. Dupont, of Detroit. Dr. C. P. Parkill, of Owosso.

Mr. James Vernor, of Detroit.

Mr. J. C. Muller, of Detroit.

DELEGATES TO NATIONAL RETAIL DRUGGISTS' ASSOCIATION.

Mr. A. W. Allen, of Detroit.

Mr. Frank Inglis, of Detroit.

W. H. Keeler, of Saginaw.

Mr. E. F. Phillips, of Amanda. Mr. A. McFarland, of Detroit.

ALTERNATES TO NATIONAL RETAIL DRUGGISTS' ASSOCIATION.

Mr. G. W. Stringer, of Detroit.

Mr. Frank Escott, of Grand Rapids.

Mr. W. H. Bigelow, of Owosso.

Mr. E. T. Webb, of Jackson.

Mr. O. B. Dickinson, of Grand Haven.

The following were elected members of the Executive Committee:

Mr. Jacob Jesson, of Muskegon.

Mr. George Gundrum, of Ionia.

Mr. Frank Wells, of Lansing.

Mr. F. W. R. Perry, of Detroit. Mr. J. E. Peck, of Grand Rapids.

Mr. Wells: We have with us, a representative of the National Wholesale Dealers' Association, Mr. Hinchman, who desires to make some remarks. I move that Mr. Hinchman take the platform.

Carried.

Mr. HINCHMAN: At the last meeting of the National Wholesale Druggists' Association, held at St. Louis in October, it was voted that the President should appoint committees to be present at the meetings of the State Pharmaceutical Associations. to assure them of a desire to cultivate friendly relations. The committee for Michigan is of four persons, of whom I am the only one present at this time.

The Wholesale Association has met annually during the last ten years. Their meetings have grown in importance and in numbers; commencing with perhaps thirty or forty, their membership has increased to 400 or 500, embracing almost every wholesale drug and chemical establishment in the United States, and including associate members who are of manufacturing or proprietary medicine houses.

It gives me pleasure to represent them, and to assure you that your interests have always been respected. I know of no action that has in any way been detrimental to the retail trade. Their efforts to introduce and make permanent a contract or rebate plan was expected to be in your interest, in the way of influencing stability of prices. They favored the adoption of the Campion plan or any other to be agreed upon by retail dealers looking to the maintenance of remunerative prices. At the meetings there have been read very important reports, and I may here mention that the efforts of their Committee on Legislation aided materially in abolishing the stamp tax. That was a matter followed up until success was achieved. The committee has also been active in endeavoring to have repealed the tax upon alcohol for mechanical and medicinal purposes, and it is to be hoped it will succeed.

It is my duty to assure you that it is the interest and the desire of that Association to promote your welfare. They will be pleased if you send a delegate or delegates to their meeting, to be held in Philadelphia on the 20th day of this month.

There is one subject that I would like to mention, and perhaps it may be unauthorized. I have read in the proceedings of this and similar associations, that complaints have been made of wholesalers for retailing. I do not know the extent of this evil, but it may be possible that the facts are overrated or overstated. As far back as 1868, to my personal knowledge, every wholesaler in Detroit put away all retail appliances, and have not since sought that trade. To be sure, if a particular friend or relative comes in for one article, they may get it, but it has been fully understood that no retailing should be done. That subject has not been brought before the Wholesale Association, but may be, if this Association thinks it proper to send a

delegate who will present it. For myself and perhaps for them I will take the liberty of inviting the retailers of this state to wholesale all they can, if anything can be made by it. The time was when the expenses of the wholesale trade was but from three to five per cent. upon the amount of sales, now they reach from nine to twelve per cent., and as customers are not charged more than an average advance of ten per cent. if you can see where the profit comes in you are sharper than I.

Gentlemen, I thank you for this opportunity of presenting the compliments of the Wholesale Association, and desire that you will accept the invitation to send delegates to that body.

Mr. Brown: I move that this Association appoint a delegate to attend this meeting of the National Wholesale Druggists' Association.

The motion prevailed.

Mr. Frank Wells, of Lansing, was elected delegate.

Mr. Wells: I am very thankful to the Association, and while I would be very glad to go to Philadelphia, the time for preparation is short, and I think it is somewhat doubtful if I can go. I therefore think if the Association deems the subject of sufficient importance, that it would be well perhaps to elect another to go if I fail to.

MR. Brown moved that an alternate be elected.

Carried.

Mr. J. C. Mueller, of Detroit, was elected alternate.

Mr. EBERBACH: I think that whoever goes will be at some expense, and I think it is hardly just for the delegate to bear the whole of the expense if he goes as a representative of this body.

Mr. MUELLER: We have talked this matter over in our meetings and never could get any relief from the wholesalers. We took it before the wholesalers here and they promised to do it but I give you my word they have never done so.

Mr. Brown: I understood Mr. Hinchman to state that this matter had never been brought before the National Wholesale

Druggists' Association, and it will never be brought before them unless it is brought there by the retailers. If we can send somebody who will bring it before them it will result in getting an expression of opinion.

As to the matter of the expense I am rather inclined to think it would be no more than right to pay the expenses of the delegate. In order to test the sentiment of the Association I would move that the expenses of one delegate to attend this meeting be borne by this Association.

Prof. Prescott: The Association will understand that this is different from a delegate sent to a state society. He is a delegate to a body in which he cannot be a member and can take no active participation. I have not made up my mind whether it is a good precedent or not.

THE PRESIDENT: It is according to how much money there is in the treasury.

Mr. Gundrum: This matter in my mind is of doubtful utility, and before voting I should like to have it ventilated a little more.

Mr. EBERBACH: On account of the small attendance, I think we had better postpone action until the next meeting.

Mr. Brown: If you do, it will result in postponing the whole matter.

Mr. EBERBACH: The point is right here. If anything of this kind is going on I think it is entirely out of place. It is entirely out of place for concerns that are doing a wholesale business to dabble in matters of this kind, as retailing an article. But the complaints have only come from two or three sources to my knowledge, and I would like to see the thing brought down to a point so we shall know what we are instructing our delegate to do. We do not want to take the position on a mere supposition that such and such is the case. I presume it does happen once in a while that a wholesaler sells a small parcel to a person not in the business, but the question in my mind is, do they make a practice of selling? If such is the case I think the

Michigan State Pharmaceutical Association is bound to back up its members in their grievances.

THE PRESIDENT: I know there are members here who can name parties not in the business in this state, who can send to wholesale dealers and get what they want.

Mr. Jesson: I would state that there is a hair dresser in Muskegon who purchases a cosmetic in a wholesale house in Detroit as cheaply as I can. She came to me for a small package and found fault with the price, and said she could get it at a figure she named which was as cheap as I could purchase it.

THE PRESIDENT: The question is, shall the expenses of the delegate be paid?

Mr. Parker, of Detroit: It seems to me it would be prudent to pay the expenses of this delegate. It is a matter of more business importance than the delegates to the state societies. That is simply a matter of courtesy and this is business.

The question was then put and carried.

THE PRESIDENT: I have been requested before leaving the Chair, to appoint the following committees for the ensuing year:

COMMITTEE ON TRADE INTERESTS:

Mr. A. Bassett, of Detroit.

Mr. E. M. Lacy, of Sault Ste. Marie.

Mr. L. S. Coman, of Bay City.

COMMITTEE ON PHARMACY AND QUERIES.

Prof. A. B. Prescott, of Ann Arbor.

Dr. A. B. Lyons, of Detroit.

Mr. O. Eberbach, of Ann Arbor.

COMMITTEE ON LEGISLATION.

Mr. E. F. Phillips, of Armada.

Mrs. C R. Taylor, of Loomis.

Mr. E. H. Kendrick, of Hillsdale.

Mr. Brown: Before we close there is one matter to which I wish to call attention. In looking over the list of members, I came across the name of Carl Reibe, who was a good member of this Association. At the first meeting he read a paper and he sent a paper to the second meeting. He left the state and



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W. H. ROCKWOOD, VICE-PRES'T.

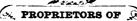
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went to Chicago, and held for some time a prominent position in a large store there. He came to Ann Arbor some six weeks ago and died. He was a bright young man, and I think it is entirely appropriate that this Association should take some action upon his death. I therefore move that a committee be appointed to prepare a minute on the death of Carl Reibe.

Carried.

The President appointed as such committee:

Mr. Brown, of Ann Arbor.

Mr. Stevens, of Detroit.

Mr. Eberbach, of Ann Arbor.

Mr. Wells: I desire to offer the following resolution:

Resolved, That the cordial welcome again extended to us by our Detroit brethren places us under new obligations to them which we can but feebly express in words. The liberal hospitality which has added so largely to the social success of our meeting has been one of those elements that has caused our unprecedented growth.

I move the adoption of the resolution.

Adopted unanimously.

Mr. Brown: Before we close, I am requested to make acknowledgement and offer the grateful thanks of the ladies to Mr. Vernor, of Detroit, for supplying them with flowers for last evening's entertainment. I move that a vote of thanks be extended to him.

Mr. Vernor: No; that is a matter purely between myself and the ladies, and the ladies and I have settled it.

Mr. DUPONT: It would seem fitting that this society should tender a vote of thanks to our retiring President for his devotion to our interests. I therefore move that the thanks of this Association be tendered to the retiring President.

Prof. PRESCOTT: I support the motion, and in doing so would add a word. We owe very much of the pleasure and profit of this meeting to the readiness, urbanity and skill with which our presiding officer has conducted our proceedings, and we are mindful in our own hearts of the obligation we owe.

The motion was carried unanimously.

THE PRESIDENT: Gentlemen, I am thankful for this additional token of your courtesy. I believe every member of the Association knows that I feel thankful. You have been kind to me for the whole year. I would like, before the adjournment is had, to have the newly elected President take the Chair.

Gentlemen of the Association, there is nothing that gives me more pleasure than to introduce to you my friend, H. J. Brown, of Ann Arbor, who has been elected your President for the ensuing year; if you show him the same courtesy you have me, it will make his heart glad; I have great pleasure in introducing to you Mr. Brown.

Mr. Brown: Gentlemen of the Association, I thank you most heartily for the honor you have conferred upon me, and I ask of you the same consideration and helpful suggestions you have given to those who have preceded me in this office. I assure you that my best endeavors shall be exerted in behalf of this Association now as they have been in the past, and I trust at our next meeting in Grand Rapids the old members and many new ones will be present, and that our meetings will be as profitable as these have been. Trusting we may all meet there one year from now, I will not detain you longer.

Mr. Wells; I would like to have the Secretary inform us what is the number of members of this Association, before we close.

THE SECRETARY: The total elected number at present is 694.

Mr. Wells: This, I believe, Mr. President, makes us the largest Pharmaceutical Association in the United States; I think Illinois comes next with a membership of about 600.

On motion the convention then adjourned to meet in Grand Rapids on the second Tuesday in October, 1886.

ANSWERS TO QUERIES

---AND----

VOLUNTEER PAPERS.

READ AT THE THIRD ANNUAL MEETING IN DETROIT.

Antidotes to be Directed upon Poison Labels.

BY JOHN S. DUNN, PH. C., SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

An accurate knowledge of poisons is one of the most necessary requirements of the pharmacist, and the proper use of poison labels is one of his most important duties. Hence, most of the states have laws requiring that all poisons be properly labeled. These may be illustrated by one or two extracts.

It is the legal requirement in Michigan, that "Any person who shall sell or deliver at retail any arsenic, corrosive sublimate or any other substance or liquid usually denominated poisonous, without having the word 'poison' and the true name thereof, and the name of some simple antidote, if any is known, written or printed upon a label attached to the vial, box or parcel containing the same, shall be punished by a fine not exceeding one hundred dollars."

In Ohio, the law requires that, "Whosoever sells or gives away any quantity of arsenic less than one pound, without first mixing therewith soot or indigo in the proportion of one ounce of soot or half ounce of indigo to the pound of arsenic, or, except upon the prescription of a physician, sells or gives away any quantity of an article belonging to the class usually denominated poisons, to any minor, or sells or gives away any such article to any person without having first marked the word 'poison' upon the label or wrapper containing the same, and registered in a book to be by him kept for that purpose, the day and date upon which it is sold or given away, the quantity thereof, the name, age, sex and color of the person obtaining the same, the purpose for which it is required, and the name and place of abode of the person for whom it is intended, shall be fined not more than two hundred nor less than twenty dollars."

Commonly the law does not require any antidote to be directed upon the label; but in some states, including Michigan, this requirement is made. The desirability of such directions is sufficiently evident, and the number of deaths by accidental poisoning would necessarily be diminished if such labels were always employed.

The directions upon poison labels should refer only to antidotes which can be safely administered by those not skilled in medicine, the design being to enable the attendant to pursue a proper course of treatment until a physician can be summoned. Hence, many antidotes, though efficient and desirable when skillfully employed, must remain altogether unnoticed.

In the following list of poisons the arrangement is alphabetical; and the proper antidotes are indicated by the use of a numeral, as is more fully explained below.

NAME OF POISONS.

Acid-	Carbolic,	-			-		Group 1
"	Chromic, and its soluble salts,			-		-	" ²
"	Muriatic, -	-			-		" 1
"	Nitrie,			-		-	" 1
46	Nitro-muriatic, -	-			-		" 1
	Oxalic, and its soluble salts,			-		-	Special
"	Prussic,		-		-		Group 4
"	Sulphuric, (oil of vitrol)	-		-		-	" 1

Aconite, and its preparations,	Group 7
Aconitine,	" 7
Antimony—Tartrated, (tartar emetic) -	" 2
" Muriate of, (butter of Antimony) -	" 2
Arsenic and its preparations,	Special
Among these may be mentioned:	_
" Ter-sulphuret of, (orpiment or king's yellow)
" Bi-sulphuret of, (realgar.)	•
" Fowler's sol. of,	
" Donovan's sol. of,	
" Copper, Aceto—arsenite of, (paris green.)	
Atropia and its salts,	Group 7
Baryta and its soluble salts,	" ⁸
" Carbonate of,	" 8
Belladonna and its preparations,	" 7
Cantharides,	" 2
" Tincture of	" 2
Caustic—Ammonia,	" 3
" Potassa,	" 3
" Soda,	" 3
Chloral Hydrate,	" 4
Chloroform,	" 4
Cobalt,	" 1
Cocculus Indicus,	" 6
Colchicum, seed and root and their preparations,	" 6
Copper—Acetate of, (verdigris.)	" 2
"Sulphate of, (blue vitrol.)	" 2
Cotton Root and its preparations,	" 5
Creosote,	" 1
Cyanide of Potassium,	" 4
" of the other alkalies,	" 4
" of Mercury,	" 4
Calabar bean and its preparations,	" 6
Cannabis Indica and its preparations,	" 6
Digitalis and its preparations,	" 7
Delphinia,	" 2
Ergot and its preparations,	" 7
Ether.	" 5

" Compound spirits of, (Hoffman's anodyne.)	Group 5
Elaterium,	" ²
Gelsemium and its preparations,	" 6
Hemlock,	" 6
Henbane,	" 7
Iodine,	" 1
" Tincture of,	" 1
" Compound tincture of,	" 1
" Compound solution of,	" 1
Lead—Acetate of, (sugar of lead) -	" 8
" Carbonate of, (white lead, flake white)	" 8
" Oxide of, (litharge)	4 8
" Solution, sub-acetate of, (Goulard's extract)	" 8
Lobelia, and its preparations,	" 7
Mercury—Its most active preparations, especially:	
" Ammoniated, (white precipitate) -	" 2
" Bi-chloride, (corrosive sublimate) -	" 2
" Red Oxide, (red precipitate)	" 2
" Red sulphuret, (vermilion)	" 6
" Red Iodide, (mercuric iodide)	" 2
" Green Iodide, (mercurous iodide) -	" 2
Morphine and its salts,	6
Nux Vomica and its preparations,	" 7
Nicotine,	" 7
Opium and its preparations, (paregoric excepted)	" 6
Oil of—Bitter almonds, (also the water of)	" 4
" Croton,	" 1
" Pennyroyal,	" 1
" Savin,	" 1
" Tansy,	" 1
" Rue,	" I
Phosphorus,	" 1
Pituri and its preparations,	" 6
Santonine,	" 6
Silver—Nitrate of, (lunar caustic)	Special
Strychnine and its salts,	Group 7
Stramonium and its preparations,	" 7
Sulphurets of the alkalies,	" 5

Tin-Muriate, solution of, -	-		-	Group	1
Veratrum Viride and its preparations,			-	"	7
Veratrum album, (white hellebore) -		-		"	7
Veratrine,			-	44	7
Zinc—Chloride of,			-	"	2
" Sulphate of, (white vitrol)		-	-	"	2
TREATMENT.					

For poisons belonging to Group 1.

Give white of eggs or flour mixed with water; then cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give strong soap suds, chalk or soda with milk, demulcent drinks of flaxseed or slippery elm.

For poisons belonging to Group 2.

Give white of eggs or flour mixed with water; then cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give strong tea or coffee, soda with milk, demulcent drinks of flaxseed or slippery elm.

For poisons belonging to Group 3:

Give vinegar, oil and milk.

For poisons belonging to Group 4:

Apply cold affusions to the head; give stimulants; apply mustard poultice to the stomach; wash with spirits of camphor or vinegar; arouse the patient; give plenty of fresh air; artificial respiration.

For poisons belonging to Group 5:

Cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; apply cold affusions; wash with spirits of camphor; arouse the patient; give plenty of fresh air; artificial respiration.

For poisons belonging to Group 6:

Cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give strong cold tea or coffee; apply cold affusions; keep the patient in constant motion; give demulcent drink of flaxseed or slippery elm.

For poisons belonging to Group 7:

Cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give strong cold tea or

coffee and powdered charcoal; give stimulants and demulcent drinks; apply warmth to the extremities; the recumbent position should be maintained.

For Poisons belonging to Group 8:

Give epsom salt freely, dissolved in water; then cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give milk or demulcent drinks.

For arsenic and its preparations:

Cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; then give hydrated oxide of iron, dialyzed iron or magnesia in abundance, followed by oil, milk or mucilaginous drinks.

For oxalic acid and its soluble salts:

Give chalk, lime, whitewash from the wall or powdered wallplaster with water. Lime-water is an antidote. Give one ounce castor oil.

For nitrate of silver:

Give solution of common salt, then cause vomiting by giving a teaspoonful of ground mustard and abundant draughts of warm water; give white of eggs or flour mixed with water.

For convenience of reference, the poisons mentioned above are here again presented in groups corresponding to the grouping of the antidotes.

GROUP I.

Carbolic acid, Muriatic acid, Nitric acid, Nitro-muriatic acid, Sulphuric acid, Cobalt, Creosote, Iodine, tincture of Iodine, compound tincture of Iodine, compound solution of Iodine, Croton oil, oil of Pennyroyal, oil of Savin, oil of Tansy, oil of Rue, Phosphorus, solution Muriate of Tin.

GROUP II.

Chromic acid and its soluble salts, Antimony tartrated (tartar emetic), Muriate of Antimony (butter of antimony), Cantharides, tincture of Cantharides, Acetate of Copper (verdigris), Sulphate of Copper (blue vitriol), Delphinia, Elaterium, the most active preparations of Mercury, especially Ammoniated Mercury (white precipitate), Bi-chloride of Mercury (corrosive sublimate) red Oxide of Mercury (red precipitate) red Sulphuret

of Mercury (vermilion), red Iodide of Mercury, green Iodide of Mercury, Chloride of Zinc, Sulphate of Zinc (white vitriol).

GROUP III

Caustic Ammonia, caustic Potassa, caustic Soda.

GROUP IV.

Prussic acid, Chloral Hydrate, Chloroform, Cyanide of Potassium, Cyanides of the other Alkalies, Cyanide of Mercury, oil of Bitter Almonds (also the water of).

GROUP V.

Cotton root and its preparations, Ether, compound spirits of Ether (Hoffman's anodyne), sulphurets of the Alkalies.

GROUP VI.

Cocculus Indicus, Colchicum seed and root and their preparations, Calabar bean and its preparations, Cannabis Indica and its preparations, Gelsemium and its preparations, Hemlock, Morphine and its salts, Opium and its preparations (except paregoric) Pituri and its preparations, Santonine.

GROUP VII.

Aconite and its preparations, Aconitine, Atropia and its salts, Belladonna and its preparations, Digitalis and its preparations, Ergot and its preparations, Henbane, Lobelia and its preparations, Nux Vomica and its preparations, Nicotine, Strychnine and its salts, Stramonium and its preparations, Veratrum Viride and its preparations, Veratrum Album (white hellebore), Veratrine.

GROUP VIII.

Baryta and its soluble salts, Carbonate of Baryta, Acetate of Lead (sugar of lead), Carbonate of Lead (white lead—flake white), Oxide of Lead (litharge), solution of Subacetate of Lead (Goulard's extract).

Arsenic and its preparations have a special antidote label; also, Oxalic Acid and its soluble salts; also Nitrate of Silver.

One of the advantages secured by this system of labels is to diminish necessary expense. The cost of buying printed labels for each poison is so great that not one pharmacist in five hundred does so. Instead, they buy for a few of the most common and use blank poison labels for the rest, writing the name of the article at the time of sale. The number of printed poison labels kept in each of five good drug stores in which I made inquiry, was from two to forty-two. Blank labels were used for other poisons. Furthermore, four out of five druggists just referred to never wrote an antidote and that one very rarely; a fact which proves another advantage of the method of labeling here presented, and that is, it secures the directing of proper antidotes upon all poisons sold, and seems the only practical way of doing this. Many poisons are so seldom used that druggists will not buy special labels for them; while time and dispatch are so necessary, they will not stop to write more than the name.

The number of different forms of labels required is eleven. That for Nitrate of Silver should have the name of the poison printed upon it, since this form of label is designed only for one substance, while in all other cases the name of the poison is supplied by the druggist.

FORM AND TRUE SIZE OF LABEL.

[GROUP—.] POISON.
Name of Poison.
Treatment.
Druggist's address.

Report of Committee on Mr. Dunn's Paper on Antidotes.

Your committee, appointed to consider the subject of antidotes to be recommended for incorporation in the labels of poisonous articles, find that the general plan described in Mr. Dunn's paper, which has been in common use for many years is a good one. The grouping of poisons adopted by Mr. Dunn is a useful one, although in a few instances changes should be made; notably in the case of "Cobalt," by which is meant an arsenical fly poison, and which therefore should be classified with other arsenical compounds. It is hardly necessary to burden such a list with preparations of so rare a drug as pituri, and indeed many of the more active poisons, being dispensed almost invariably on physicians' prescriptions rarely require to have the antidote stated on the label.

It has seemed to your committee that it would be wise to divide some of Mr. Dunn's groups, since in a few cases there are important differences in the line of treatment to be pursued in poisoning by agents which have been grouped together. We would separate from the group of mineral acids, carbolic acid, which should form with creosote and resorcin, a distinct group. We would give for nux vomica and its preparations, including the salts of strychnine, a special plan of treatment, and would separate also from group seven of Mr. Dunn the depressing agents which call for certain important modifications in treatment. Phosphorus cannot be included in any group, and for this poison, a special antidote is recommended, although it is not often that such a label could be required, except on a phosphorus paste sold for rat poison.

In this connection your committee would call attention to the fact that poisons, such as arsenic are sold in this State under fictitious names such as "Rough on rats," without any intimation of their true nature and, of course, without antidote labels. If our present laws do not cover such cases, as one would suppose they might, we should have more stringent legislation, requiring that all such articles be accompanied with directions for treatment in case of accidental or intentional poisoning by

their use. Many deaths have been reported from "Rough on rats," which is almost pure arsenious oxide, but it is sold under a label that implies that, whatever it may contain, it is not a compound of arsenic.

The directions for treatment on labels such as are here contemplated, must be made as explicit as possible, and should be for the guidance, not of the physician, but of members of the family, who by prompt action may save a life that would be lost if nothing were done until the doctor should arrive. The plan of treatment should therefore be such as can be carried out with materials that are almost certain to be at hand. In a few cases, as in arsenical poisoning, it has been thought best to depart from this rule inasmuch as there is for arsenic an anti-dote of established utility which may almost always be procured from some drug store in season to be of service.

In England it is recommended that there be kept in every household a collection of antidotes for the more common poisons. with full instructions with regard to their use. If there were such a collection put up in this country, it would be easy to refer in these labels to the several articles in it without going into detail in the instructions for their use. In absence of anything of the kind, we submit the following modification of Mr. Dunn's system of labels. We would retain the general form of the label, suggesting that for large establishments it would be best to have printed strip labels for the individual poisons, to be pasted over the antidote label in place of writing the name of the poison with ink or pencil. A neater appearance would result if the antidote labels were made with an opening in place of the blank space for the name, and the strip label were pasted on the bottle before putting on the antidote label. The word "poison" at least, if not the whole label, should be printed in red to attract attention, and in general the practice of distinguishing all poisonous articles with red labels is to be encouraged; it is already largely practiced by the manufacturers and in some states is required by law; were it generally done, its significance would soon become universally understood.

Fourteen labels are required. The following is a list of the principal poisons for which antidote labels should be provided, with number of the label giving appropriate treatment.

In the case of some of the articles named, such as alcohol, it is questionable whether it is advisable generally to use an anti-dote label. Its only use would be practically to keep before the minds of the people the essentially poisonous character of these articles. On the other hand we should strongly urge that such articles as paris green which are especially liable, from their known poisonous character to be used for criminal or suicidal purposes, should always have attached to the packages containing them an antidote label.

The list with grouping is as follows:

The list with Grouping is as follows:	
Acid Acetic (strong)	Group 1
" Carbolic,	" 2
" Muriatic,	" 1
" Nitric,	" 1
" Nitro muriatic,	" 1
" Oxalic and its soluble salts,	" 11
" Prussic and its salts,	" 5
" Sulphuric,	" 1
Aconite and its preparations,	" 7
Aconitine and its salts,	" 7
Alcohol,	" 5
Antimony, salts of,	" 3
Arsenic-Compounds of, including Paris green,	" 10
Atropine and its salts,	" 8
Barium, salts of,	" 12
Belladonna and its preparations,	" 8
Benzine and Benzole,	" 5
Calabar bean and its preparations,	" 8
Camphor, -	" 5
Cannabis Indica and its preparations,	" 6
Cantharides and its preparations,	" 3
Carbon bi-sulphide,	" 5
Caustic Alkalies and Ammonia,	" 4
Chloral hydrate,	" 5
Chloroform,	" 5
Cobalt, (Arsenical fly powder)	" 10
Cocculus indicus,	" 9
Colchicum and its preparations,	" 3
Copper, salts of,	" 3
== :	

Cotton root and its preparations, -	-	"	7
Creosote,	-	46	2
Cyanide of Mercury, -	-	"	5
Cyanide of Potassium, -	-	"	5
Digitalis and its preparations,	-	"	7
Ergot, " " -	-	"	7
Elaterium,	-	"	3
Ether and Spts. Ether Co.,	-	"	5
Gelsemium and its preparations,	•	"	8
Hemlock (Conium) and its preparations,	-	"	8
Henbane and its preparations,	-	"	8
Iodine and its preparations, -	-	"	3
Jaborandi and its preparations,	-	"	8
Lead, salts of,	-	"	12
Lobelia and its preparations,	-	"	7
Mercury, salts of,	-	. "	3
Morphine and its salts,	-	"	6
Nux Vomica and its preparations,		46	9
Opium and its preparations, (except paregoric)	-	"	6
Oil of Bitter almonds,	-	44	5
" Croton,	-	"	3
" Mirbane,		"	5
"Savin,	-	46	3
" Tansy,	-	"	3
Pilocarpine and its salts,	-	. "	8
Phosphorus, (rat paste)	•	"	14
Potassium, bi-chromate,	-	46	3
Resorcine,	-	"	2
Santonine,	-	"	8
Silver, nitrate,		"	13
Stavesacre seed,	-	"	8
Strychnine and its salts,	-	"	9
Stramonium and its preparations,	-	"	8
Sulphurets of the Alkalies,	-	"	5
Tin, muriate of,	-	"	3
Tobacco and its preparations,	-	"	7
Veratrine,	•	"	7
Veratrum Album,	-	"	7

Veratrum Viride and its preparations, - - " 7 Zinc, salts of, - - - " 3

The treatment recommended is as follows:

GROUP I.

Give no emetic. Give at once large draughts of water (or milk) with chalk, whiting, magnesia, or baking soda, or give strong soap suds, to neutralize acid; olive oil, white of egg, beaten up with water, and later, mucilaginous drinks of flaxseed or slippery elm, are useful. Give laudanum (20 drops) if much pain.

GROUP II.

Promote vomiting with warm water containing baking soda, or cause it with mustard, (a tablespoonful, stirred to a cream with water.) Give white of egg, beaten up with water, or olive oil (a cup full;) stimulants (whisky, &c.) freely; warmth and friction to the extremities.

GROUP III.

Give white of eggs (½ dozen or more, raw) or flour, mixed with water. Promote vomiting with warm water containing baking soda, or cause it with mustard (a tablespoonful, stirred to a cream with water.) Give strong tea or coffee, stimulants, if needed, laudanum (20 drops) if much pain; demulcent drinks of flaxseed or slippery elm.

GROUP IV.

Promote vomiting by large draughts of warm water. Give vinegar or diluted lemon juice; olive oil, the whites of eggs, beaten up with water, gruel, or demulcent drinks of flaxseed or slippery elm; laudanum, (20 drops) if much pain.

GROUP V.

If necessary give emetic of mustard (a tablespoonful, stirred to a cream with water.) Let patient have plenty of fresh air; maintain a horizontal position. Keep the body warm, but try to rouse patient by ammonia to nostrils, cold douche to head, friction and mustard plasters to limbs, &c. Use artificial respiration.

GROUP VI.

Give emetic (if necessary) of mustard (a tablespoonful, stirred to a cream with water) followed by large draughts of warm water. Then strong tea or coffee. Arouse the patient, and keep him awake and in motion. Keep up artificial respiration even after life seems to be extinct.

GROUP VII.

Give emetic of mustard (a tablespoonful, stirred to a cream with water) followed by large draughts of warm water. Give strong tea or coffee, with powdered charcoal; stimulants, (whisky, &c.,) freely; warmth to the extremities; keep the patient in a horizontal position; use artificial respiration persistently.

GROUP VIII.

Give emetic of mustard, (a tablespoonful, stirred to a cream with water) followed by large draughts of warm water; give strong tea or coffee, with powdered charcoal; stimulants (whisky, &c.,) if necessary; rouse the patient if drowsy; heat and friction to extremities; artificial respiration.

GROUP IX.

Give emetic of mustard (a tablespoonful, stirred to a cream with water) followed by large draughts of warm water. Give powdered charcoal, iodide of starch, or tannin. To relieve spasms let patient inhale pure chloroform, or give chloral hydrate, (25 grains) or potassium bromide, ($\frac{1}{2}$ oz.) Lose no time.

GROUP X.

Promote vomiting with warm water, or cause it with mustard (a tablespoonful, stirred to a cream with water.) Procure at once from a drug store, hydrated oxide of iron, and give a cupful of it, (or mix a teaspoonful of calcined magnesia with a cup of water, add three teaspoonfuls of tineture of iron, mix well and give the whole of it.) Follow with olive oil, or whites of eggs (raw) and mucilaginous drinks. Laudanum (20 drops) if much pain.

GROUP XI.

Give chalk or whiting, (a tablespoonful) or even air slacked lime (a teaspoonful in fine powder) mixed with two tablespoonfuls of vinegar (do not give soda or potash to neutralize the acid.) Promote vomiting by large draughts of water, or cause it with mustard (a tablespoonful, stirred to a cream with water.) Give olive oil and mucilaginous drinks; stimulants (whisky, &c.,) and warmth to extremities.

GROUP XII.

Give epsom salt (½ oz.) or Glauber's salt (1 oz.) dissolved in a tumbler of water. Promote vomiting by warm water, or cause it with mustard (a tablespoonful, stirred to a cream with water.) Give milk, demulcent drinks of flaxseed or slippery elm, and laudanum (20 drops) if much pain.

GROUP XIII.

Give common salt (a tablespoonful dissolved in a tumbler of warm water;) then an emetic of mustard (a tablespoonful, stirred to a cream with water,) followed by large draughts of warm water. Later, give gruel, arrow root, or demulcent drinks of flaxseed or slippery elm.

GROUP XIV.

Give an emetic of mustard (a tablespoonful stirred to a cream with water) or better, of blue vitrol, 3 grains every 5 minutes, until vomiting occurs. Give a teaspoonful of old, thick oil of turpentine; also, epsom salt (\frac{1}{2} oz. in a tumbler of water.) Do not give oil, except the turpentine.

Respectfully submitted,

A. B. LYONS,
O. EBERBACH,
G. W. STRINGER,
Committee.

What is the strength of Water of Ammonia and the Mineral Acids used in Dispensing Pharmacy?

GEO. GUNDRUM, OF IONIA.

The Pharmacopæia recognizes but two Waters of Ammonia, one of ten per cent. and the other of twenty-eight per cent. I tested twenty-five samples, twenty-three of which could be classed as simply Water of Ammonia, and two as stronger Water of Ammonia.

In trade the unintelligible 3 and 4 F is used, the dealer or manufacturer supplying for a 3 F, an Ammonia of about 6 to 7 per cent. and for 4 F about a 10 per cent. solution; of course it may be more or less.

Two of the samples were of stronger Water of Ammonia, which had stood some time, well corked, but fell very much short of the required strength.

I would suggest to the pharmacist in buying, to call for an Ammonia of 10 per cent. or stronger water; as it now is, the Pharmacopæial requirements seem to be neglected, but if the pharmacists generally would call for it they could soon in my estimation bring about a change, putting per cent. in place of 3 and 4 F.

The analyses resulted as follows:

No	. 1	contained	NH_3	9.2 p	er cent.
"	2	"	44	8.6	"
"	3	4	"	10.0	
"	4	"	"	8.76	и
46	5	46	44	11.2	"
"	6	"	"	8.2	···
46	7	и	44	8.6	"
	8	"		8.3	"
46	9	44	46	10.0	"
"	10	"		13.6	"
"	11	"	"	7.6	u
46	12	"	44	10.16	"
	13	44	44	20.75*	"
"	14	"	"	6.6 p	er cent.
"	15	44	"	8.5	"
"	16	"	44	11.4	"
"	17	u	"	12.0	"
	18	. "	"	7.8	"
46	19	"	"	10.5	"
"	20	"	"	8.5	"
"	21	"	"	4.2	"
46	22	44	"	20.2*	"
46	23	"	"		
	24	"	"	11.1	"
	25	"	"	12.0	
	*R	tranger Water	rof An	omonia.	

----*Stronger Water of Ammonia.

Of the Sulphuric Acid there is not much to say except that the samples surprised the writer in running so uniformly high. There was but one of the fifteen that fell below ninety per cent., that one being 89 per cent. Two were C. P. acid; one stood full test, 96 per cent., and the other stood no better than the commercial Sulphuric Acid.

The U.S.P. requirement is 96 per cent.

No. 1 contained H₂SO₄ 96* per cent.

"	2	"	"	92	"
"	3	"	"	90	"
"	4	"	"	92	"

----*C. P. Acid.

No.	5	contained	H_2SO_4	92*	per ct.
"	6	"	"	92	"
"	7	"	"	91	"
46	8	"	"	90	"
"	9	"	"	90	46
"	10	"	"	91	"
"	11	"	66	94	"
44	12	"	"	95	44
"	13	"	"	89	"
"	14	"	"	91	"
"	15	"	"	90.6	"

---*C. P. Acids.

In regard to Hydrochloric Acid, the same holds true; because an acid is marked C. P. it does not follow that it is full strength; while two C. P. acids were of good strength, viz: 31.8 and 30 per cent., the third was as low as the lowest of the commercial acids.

The U.S. P. requirement is 31.9 per cent.

			_		-
No). 1 c	ontained	HCl	29.5 pe	er cent.
"	2	"	"	$31.8\bar{\dagger}$	"
"	3	"	u	29.8	"
"	4	"	"	28.5	46
"	5	"	"	26.0	"
"	6	"	46	24.5	46
"	7	"	"	24.5†	"
"	8	"	"	30.0†	"
"	9	"	"	29.9	"
"	10	"	44	29.0	"
"	11	"	"	28.0	"
"	12	"	"	27.0	"
"	13	"	"	27.5	u
, "	14	u	"	28.0	"
"	15	"	"	32.9*	"

^{——†}C. P. Acids. ——*1 per cent. more than U. S. P. requirement.

Nitric Acid was lower in strength than either Sulphuric or Hydrochloric Acids, but the C. P. Nitric Acids were of better strength comparatively, than the Sulphuric or Hydrochloric.

The U.S. P. requirement is 69.4 per cent.

No	. 1	contained	HNO ₃	52.0 per	cent.
"	2	"	"	49.6	"
"		"	"	59.0	"
	4	46	46	67.4*	46
"	5	"	"	48.0	46
"		"	"	59.0*	44
"		"	46	55.0	"
"	8	"	"	39,0	66
"	9	"	44	53.0	"
"	10	"	**	56.0	• 6
"	11	"	66	67.0	44
"	12	61	"	63.6*	44
"	13	"	"	51.0	•
46	14	"	66	57.0	44
"	15	"	"	55.0	"

---*C. P. Acids.

The strength of the ammonia was determined with a volumetric solution of Oxalic Acid, and the acids with a volumetric solution of Soda.

GEO. GUNDRUM.

The Pepsins of the Trade.

WM. F. RANKE, JR., PH. C., SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

Various kinds of Pepsin are sold to the trade variously as Saccharated Pepsin, Pure Pepsin, Concentrated Pepsin, Scale Pepsin and Crystal Pepsin.

The U.S. P. recognizes only Saccharated Pepsin. Pepsin. according to the Pharmacopæia is the digestive principle of the gastric juice, obtained from the mucus membrane of the stomach of the hog, and mixed with sugar of milk. It is described as being a white powder of a slight, but not disagreeable odor and taste, and a slightly acid reaction. It is not completely soluble in water, leaving floccules of pepsin floating in the solution, which, however, dissolve on addition of a small quantity of hydrochloric acid. Strong turbidity of the acidulated solution indicates the presence of mucus, which also imparts to the pepsin a decided odor (eventually becoming ammoniacal) and a disagreeable taste.

"One part of Saccharated Pepsin, dissolved in 500 parts of water, acidulated with 7.5 parts of hydrochloric acid, should digest at least 50 parts of hard boiled egg albumen in five or six hours, at a temperature of 38° to 40° Cent. (100°-104° Fahr.)"—U. S. P.

The strength required by the Pharmacopæia is 4 1-6 times stronger than the strength suggested by Mr. Scheffer (Am. Journal of Pharmacy, 1872,) who directed that 10 grains of the pepsin should dissolve 120 grains of albumen. Its power of dissolving albumen changes greatly under different circumstances. Temperature, strength of acid, quantity of fluid in relation to the pepsin employed, the time used for solution, the degree of fineness of the albumen (an especially important condition) have influence upon the amount of albumen dissolved. Pepsin without acid does not dissolve albumen ("New Remedies," August, 1883, pages 237-238.) Salt and alcohol impair its digestive power. Pepsin when in solution loses its digestive power by keeping, but when hydrochloric acid is added it retains its digestive power longer. A solution of pepsin, when acidulated with hydrochloric acid, furnishes a precipitate with alcohol and tannin. When a solution of pepsin has been made alkaline, and then acidulated, it will be found to have lost its power of dissolving fresh coagulated bumen. (National Dispensatory, 2d edition.)

For the purpose of ascertaining the digestive power of the various pepsins of the trade, I procured fourteen samples from different drug stores, and six samples from different manufacturers in Detroit and Philadelphia. I found a great irregularity in the strength of these pepsins, only one coming up to the strength required by the U.S.P. The Concentrated, Pure, Scale and Crystal Pepsins were all claimed by manufacturers to be ten times the strength required by the Pharmacopæia, but they did not come up to this strength, the highest amount of albumen dissolved being 175 times its own weight. Following are the results, according to the methods given by the Pharmacopæia:

- No. 1. Saccharated Pepsin. A white powder having no unpleasant odor; contained no mucus. It dissolved 39 parts of hard boiled egg albumen.
- No. 2. Saccharated Pepsin. Of chalk-like appearance, had no unpleasant odor, no mucus, and dissolved 31 parts of albumen.
- No. 3. Saccharated Pepsin. A white powder, no unpleasant odor, contained no mucus, and digested 24 parts of albumen.

- No. 4. Saccharated Pepsin. Of a yellowish brown color, a disagreeable, glue-like odor, contained some mucus and dissolved 18 parts of albumen.
- No. 5. French Pepsin. A yellowish appearance, slight odor, and had a small amount of mucus. It was mixed with starch instead of sugar of milk, and dissolved 50 parts of albumen.
- No. 6. Saccharated Pepsin. A white color, slight odor, contained no mucus, and dissolved 15 parts of albumen.
- No. 7. Golden Scale Pepsin. Appeared in small lumps, was soft and pliable, had a disagreeable odor, and contained some mucus. It dissolved 153 parts of albumen.
- No. 8. Saccharated Pepsin. Of a white appearance, without disagreeable odor or mucus, and dissolved 45 parts of albumen.
- No. 9. Saccharated Pepsin. Of a nearly white color, without disagreeable odor or mucus, and dissolved 40 parts of albumen in six hours, and 50 parts in twenty-four hours.
- No. 10. Concentrated Pepsin. Of a whitish-gray appearance. a salty taste, was free from mucus and had a slight odor. It dissolved 125 parts of albumen.
- No. 11. Saccharated Pepsin. A white, very bulky powder with a slight odor to it and free from mucus. It dissolved 16 parts of albumen in six hours and 50 parts in twenty-four hours.
- No. 12. Scale Pepsin. In thin, light brown scales of a disagreeable odor, and contained mucus. It dissolved 115 parts of albumen.
- No. 13. Saccharated Pepsin. Of an early white color, a slight odor and containing no mucus. It dissolved 20 parts of albumen in six hours, and 40 parts in twenty-four hours.
- No. 14. Saccharated Sheep Pepsin. Of a nearly white color, intermingled with some brown spots, with a slight odor, and free from mucus. It dissolved 33 parts of albumen.
- No. 15. Commercial Saccharated Pepsin. Of a white appearance, had a slight odor, and contained mucus. It dissolved 9 parts of albumen.

- No. 16. Saccharated Pepsin. Of a nearly white color, a slight odor, and contained no mucus. It digested 43 parts of albumen.
- No. 17. Lactated Pepsin. Five grains of this were stated to represent one grain of pepsin. It was a light gray powder of an acid taste, and contained no mucus. It dissolved 25 parts of albumen.
- No. 18. Pure Pepsin. A light gray powder, of a slight odor, and contained no mucus. It dissolved 175 parts of albumen.
- No. 19. Crystal Pepsin. Of a light yellow, crystal-like appearance, and of a very distinct odor. It dissolved 75 parts of albumen.
- No. 20. Pure Pepsin. A gray powder, of slight odor, contained no mucus, and dissolved 125 parts of albumen.

The fluid preparations vary greatly in strength.

No. 1. A light yellow liquid, of an acid taste, and slightly aromatic odor. The manufacturers claimed that one fluid ounce contained thirty grains of Saccharated Pepsin. On this basis, one part of pepsin in solution dissolved 20 parts of albumen.

No. 2 was of the same make, but was fresh, while No. 1 had been opened at least three months. One part of pepsin in solution of sample No. 2 dissolved 32 parts of albumen.

Lately some objection has been offered against the Pharmacopæial mode of assay, because the amount of water in the albumen varies. I therefore tried pure dried blood albumen, taking one part of a given Saccharated Pepsin, 7.5 parts hydrochloric acid, twenty-five parts of blood albumen, and 500 parts of distilled water, and digested at 40° Cent. six hours; then filtered the liquid through a tared filter, finally put the albumen in the filter, washed a short while, dried the contents of the filter, weighed, and found it had dissolved four parts of the albumen. This was repeated several times with the same results. Lean mutton was then taken, cut into fine pieces, and four parts of the meat to one part of the same pepsin were taken (U. S. Dispensatory, page 1087, 15th edition) and added to 7.5 parts hydrochloric acid and 500 parts of distilled water.

This was digested for six hours at 40° Cent.; the residue was weighed and two and a half parts of meat found to be dissolved. In a second trial two and three quarter parts were dissolved, and a third trial resulted the same as the first.

I then took fifty parts of hard boiled egg albumen, pressed it slightly between blotting paper to take up adhering moisture, then passed it through a moderately fine hair sieve, pressed it between blotting paper, weighed it, and found the weight to be forty-four parts. Allowing one part for waste, I now take one part of Saccharated Pepsin, 7.5 parts of hydrochloric acid, fortyfive parts of the egg albumen, as referred to above, 250 parts of distilled water, and set aside for five hours at 39° Cent. The albumen is very readily soluble in this fine state of division. Pepsin acts more readily on the albumen if in solution, more concentrated than the one required by the Pharmacopæia. Hard boiled egg albumen serves better than either the dried blood albumen, or the lean mutton. The only desirable modifications of the Phamacopœial process, so far as shown by these experiments, would be (1) the preparation of the egg albumen in fine division, grated by a sieve, drying it between blotting papers before it is weighed; (2) an increase in concentration, -taking 250 instead of 500 parts distilled water.

A list of Galenical solutions and other preparations which can most advantageously be made by the dispensing Pharmacist, but which are now largely purchased ready made.

JACOB JESSON, MUSKEGON.

A list of the galenical solutions and other preparations that can advantageously be prepared at home, would embrace every galenical preparation of the Pharmacopæia as well as the elixirs, and such other preparations as are usually purchased ready made. Every retail druggist who is a pharmacist can easily prepare such articles as may be required in his vicinity, and can usually find plenty of time for work of that kind which is both pleasant and profitable. For example, taking the price list of a leading eastern house we find the following quotations which does not include containers:

Tr.	Aconite root,	Wholesale Price. 75 cents		C	Cost to Manufacture. 55 cents.		
"	Aloes,	60	"		25	"	
"	Arnica,	50	u		35	u	
"	Belladonna,	50	u		20	"	
"	Benzoin comp.,	7 5	"	•	4 5	" ·	
"	Capsicum,	70	"		30	"	
	- ,						

Tr. Iodine,	Wholesale Price. 1.00 cents.		Cost to Manufacture. 64 cents.			
" Myrrh,	65	"	38	"		
" Opium,	1.25	. "	85	"		
" Opium, deod.*	2.00	"	98	"		
Wine of Pepsin,	95	"	55	"		
Syr. Acacia,	75	"	08	"		
" Wild cherry,	40	"	06	"		
" Rhubarb,	60	"	28	"		
Fowler's Sol. Arsenic,	· 12	"	03	"		
Dovers powder,	1.15	"	85	"		
Lead plaster,	38	"	24	"		
ATT C TO 4000						

----*U. S. P., 1889.

These are a few of the many simple preparations that are usually prepared (or should be prepared) at home. If they yield such a handsome profit to the manufacturer, how much more will the preparations yield that require more skill. Take for example the opium preparations, the difference in the price quoted between tincture opium and deoderized tincture of opium is 75 cents; in cost, the difference is only 12 cents, and by saving the ether and using it over again in the next operation the cost of the deodorized tincture of opium is even less than tincture of opium.

These are only a few samples taken at random, but the above will hold good in every preparation used, from a simple tincture to the most difficult extract. Another consideration is, that the preparations prepared at home will be of superior quality because the pharmacist will exercise more care in preparing such articles than the hired man of the wholesale dealer, or so called manufacturing chemist, who may not have any qualifications for such work.

The United States Pharmacopæia, of course, must be strictly adhered to for all officinal preparations, and the very best raw material employed that can be purchased, regardless of price. If a drug is inert or spoiled, we cannot expect to make it up into preparations that will be satisfactory to the physician or creditable to ourselves.

Mr. G. H. Chas. Klie, in a paper read before the Missouri Pharmaceutical Association, makes this statement:

"About twelve years' experience in the making of fluid extracts, demonstrates to me the fact that from 25 to 50 per cent. of profit is realized when compared with manufacturers' prices. I make fluid extracts in from ½ to 10 pound lots. Making only a small quantity of any given fluid extract will cost more in proportion than if a larger quantity is made. The larger the amount made the more can labor and material be economized, so to speak. The profit mainly represents pay for labor. Manufacturers realize even more profit than this because they buy drugs in larger quantities and from first hands. I find this branch of the business more satisfactory and profitable than some others."

"It would doubtless be a matter of surprise to many of you if we could furnish statistics showing the proportion of readymade articles retail druggists are obliged to handle in addition to the regular and ordinary patent medicines. Physicians are more largely responsible for this state of affairs than is generally supposed. While loudly condemning nostrums, in their individual and collective capacity, many daily prescribe Bromidia, Iodia, Listerine, and hundreds of similar preparations—insist upon Jones' Elixir because they like the taste better than those made by Brown-one specifies A. & B.'s Pills, because they are round and not oval, while another prefers B. & C.'s because they are oval and not round-must have a certain brand of pepsin, because it is patented and advertised, and the maker announces that he has secured an injunction against some one else who was willing to supply a suffering world with an equally meritorious article, at a price more nearly representing its intrinsic value and, so on ad infinitum, ad nauseam.*

There is scarcely an article wanted by the physicians or the public, belonging to legitimate pharmacy that can not be manufactured at home by ourselves and of superior quality to many of the goods obtained in the market, some of which do not even contain the name of the manufacturer on the label of the article.

By careful work and study, all the preparations in use—officinal and unofficinal, including pills, can be prepared at home,

^{*}From report of the drug market read before the Pittsburg meeting of the American Pharmaceutical Association.

as reliable as any obtainable, if not more so. Our work, if well done, will inspire such confidence in the physicians that they will be quite willing to prescribe our preparations in preference to the numerous semi-patent preparations with which the country is flooded.

Oleate of Zinc; its properties and preparation. Is the article sold under this name a true Oleate?

T. J. WRAMPELMEIER, ANN ARBOR.

We meet with two distinct kinds of preparations, both of which bear the name Oleate of Zinc. The first occurs in the form of a soft solid, of about the consistency of tallow. The other is in the form of a white powder, possessing a soapy feeling when rubbed between the fingers.

The first is not, strictly speaking, zinc cleate, but a mixture of zinc cleate with cleic acid, usually in such proportion as to represent 5% of zinc oxide. Two samples of "zinc cleate" of this class were analyzed.

- No. 1. Dirty white mass, consistency of tallow and showing some globules of a yellow oil (probably cleic acid not properly incorporated) and possessing a slight, disagreeable odor. It was at least six months old. It was found to contain 6.9% zinc oxide.
- No. 2. In appearance about the same as No. 1, but possessed a stronger odor and was probably older than No. 1. It yielded upon analysis, 4.1% zinc oxide.

Of the second class of preparations three samples were examined. They were all in the form of white powder, and yielded, upon analysis, the following results, viz:

No. 3—15.5% zinc oxide.

No. 4—13.6% " "

No. 5—11.2% " "

Showing considerable variation, though they all approach the composition of zinc oleate, which, if pure, should yield 12.9% zinc oxide.

These preparations are made by double decomposition of an alkaline cleate and a zinc salt. The alkaline cleates are sometimes made by neutralizing cleic acid with sodium or potassium hydrate or carbonate. Some manufacturers, however, use castile soap, which is principally sodium cleate. Since the castile soaps are not pure cleates, but mixtures in varying proportions of cleates and salts of other fat acids (stearic palmitic, &c.,) and since even the better qualities of cleic acid of commerce are mixtures, it is not difficult to explain the variation in per cent. of zinc oxide; and we may regard these preparations as (practically) true cleates.

It has been maintained by some (Squibb, Ephemeris Vol. I., 167,) that the preparations made by direct combination of zin. oxide with oleic acid, in presence of an excess of the latter, are much more effective, when the therapeutic action of a zinc salt is desired, than the dry powdered oleates. But preparations of that class have the disadvantage that they are unstable on account of the large excess of free oleic acid, and after a time they become rancid and unfit for application. Therefore the zinc oleate, if it is to be prepared in this way should be prepared when wanted. The precipitated oleates, however, possess the advantage of perfect stability and may be kept any length of time. In case it seems probable that the action is obtained better from the other preparation (containing only 5% zinc oxide in excess of oleic acid) I would recommend that the dry powder be kept in stock and the 5% oleate made extemporaneously by triturating five parts thereof with eight parts oleic

acid, facilitating the mixture, if necessary, by warming slightly for a minute or two. In this way an cintment, possessing all of the properties of a freshly prepared "5% oleate" can be made in a few minutes.

The method of making the dry oleate recommended by Mr. Parsons, (Druggists' Circular, Jan. 1885) is the simplest and best. He uses a solution of castile soap and mixes it with a solution of zine acetate. He points out the fact that zine sulphate is frequently used instead of the acetate and that the sodium sulphate produced in the double decomposition, and whose presence in the oleate would cause it to be irritating, is very hard to wash out, whereas the sodium acetate on account of its greater solubility can be easily removed. I have proved that to be true, and examination showed me that two of the three preparations I had contained considerable amounts of sodium sulphate.

The preparation should always be tested for sulphates. This may be done by treating a little of the cleate in a test tube with boiling water, filtering and adding a drop of solution of barium chloride. If a precipitate is produced, the cleate should be washed with hot water until the washings cease to give a precipitate with barium chloride.

Oleate of Arsenic; can a chemical compound of this name be formed? What is the character of the article furnished as Oleate of Arsenic?

T. J. WRAMPELMEIER, OF ANN ARBOR.

The use and the preparation of "Oleate of Arsenic" were first described by Dr. Shoemaker (Trans. Penna. State Med. Soc.). He says, "arsenicum oleate must be derived by making arsenicus chloride by the cautious saturation of hydrochloric acid with arsenicum metal. The solution thus obtained precipitates from sodium oleate the oleate required."

Now "metallic arsenic," as it is called, is practically insoluble in hydrochloric acid. Fehling says, that in the presence of air it is attacked with a formation of a very small amount of arsenious chloride. In order to satisfy myself, I digested some metallic arsenic in concentrated hydrochloric acid (specific gravity 1.19) for five days. Apparently the arsenic was not attacked, and an examination of the liquid showed it to contain only an exceedingly minute trace of arsenic, so that, if the process of Dr. Shoemaker has been correctly described in the paper quoted, he obtained, not oleate of arsenic, but a mixture of free fatty acids with some soap which might be precipitated by the so-dium chloride formed in the reaction.

Mr. H. B. Parsons, in his "Working Formulæ for Oleates," published in the Druggists' Circular, January, 1885, recommends to dissolve 48 grains arsenic trioxide in water by the aid of an equal amount of potassium bicarbonate, and to add to the cooled solution 220 grains hydrochloric acid (1.16) and, after diluting this solution, to mix with a certain amount of solution of sodium oleate (a solution of castile soap), and to wash the oleate which separates with boiling water.

Now, the authorities say that the arsenites are compounds easily decomposed, even by weak acid, with liberation of arsenious acid, and further that arsenious chloride itself is decomposed by water into arsenious acid and hydrochloric acid. Hence, I do not think there is more than a trace of arsenious chloride formed by this method. Here again, then, the precipitating agent is hydrochloric acid and not arsenious chloride, and the so-called oleate is a mixture of fat acids with a little soap, and if any arsenic is precipitated, it is carried down mechanically.

Notwithstanding these considerations I made a preparation following Mr. Parsons's directions accurately. I obtained thus a mass of greenish-yellow color, about the consistency of butter, and apparently homogeneous, as it melted to a clear liquid when heated. After standing two or three weeks in a place where the temperature once or twice rose as high as 90°, it separated into an oily liquid and a granular sediment. The granular substance proved to be soap, and the oil appeared to be oleic acid. Upon heating the mixture the granular substance re-dissolved, and, upon cooling rapidly, the mixture solidified to a homogeneous mass like the original preparation. An analysis showed it to contain 0.4 per cent. As₂O₃, whereas a true arsenious oleate (As(C₁₈H₂₃O₂)₈) would contain 10.77 per cent. The arsenic was estimated as ammonio-magnesium arseniate [(MgNH₄AsO₄)₂+H₂O] after oxidizing the organic matter by heating with fuming nitric acid in a sealed tube for about five hours at 250° to 300° C.

I obtained two samples of "oleate of arsenic," manufactured by two well known firms. No. 2 was of the consistency of hard butter but more granular. It was white, slightly mottled, and possessed a slight odor. It retained its consistency during the warm weather. An analysis yielded 0.3 per cent. As₂O₃ instead of 10.77 per cent. No 3, when the bottle was deprived of its paper wrapper, was found to be decomposed, separated into three layers—the lower of water, the upper a thin oil, and in the middle a granular substance found to be a soap. No analysis was made of it.

My conclusions are, therefore, that the "oleate of arsenic" of the trade is not an oleate of arsenic; that if it contains any arsenic it is held there mechanically; that oleate of arsenic cannot be prepared by any of the methods proposed, and probably is not capable of existence.

Bromine and the Saline Wastes of the Saginaw Valley.

S. S. GARRIGUES, M. D., OF ANN ARBOR.

As early as 1863 the writer's attention was called to the saline wastes of the Saginaw Valley salt works, and tests for the presence of Bromine were made. A few years later more definite tests were made, but the percentage of Bromine was found to be so small that it did not warrant the expense of separating it; 0.236 of Bromide of Magnesium being present. A. H. Mershon, then superintendent of the Tilden & Sackett salt works, put up a Bromine still, but the amount produced was small, and the enterprise was soon abandoned.

In 1880, Mr. Dickey, of Allegheny City, came to the Saginaw Valley for the purpose of looking into the production of Bromine from the saline wastes. Like myself, he went through an investigation of those wastes both at Bay City and Saginaw. He was about to leave the Valley, when, during a personal interview, the writer informed him of his previous investigations and their results.

In the meantime salt wells had been put down at Midland, Midland Co., about 20 miles west of the Saginaw Valley. The specific gravity of these wells being about 1.2273, the writer strongly suspected the presence of Bromide of Magnesium as one of the constituents of the brine. At my suggestion, Mr. Dickey paid the locality a visit and took home with him to Allegheny City a barrel of the mother liquors to test for the presence of Bromine. Analysis by Mr. Ayres of the university, gave the following results:

ANALYSIS OF BRINE FROM WELL OF HARRIS BRO'S AT MIDLAND, MICH.; DEPTH OF WELL, 1,300 FEET.

Specific gravity, 1.2273.

		No. 2.
Sodic chloride	14.8984	14.7599
Calcic chloride	8.6666	8.8760
Magnesic chloride.	2.4665	2.4109
Magnesic bromide.	0.8771	0.8771
Ferrous carbonate.	0.1144	0,0954
Calcic sulphate	0.0199	0.0220
Water	. 69.5250	69.5250

Analysis of Bittern from above brine:

Specific gravity, 1.2557.

4 6.0801
414.5859
3 3.4019
6 4.8356
0 0.0160
163.3941

The result of this investigation was, that a Bromine manufactory was established with two stills, having a capacity of

200 pounds per day. Since that time the production of Bromine has been one of the industries of Michigan.

In 1866, Dr. H. C. Hahn, then employed as chemist for the New York and Michigan solar salt companies, made a number of analyses of Saginaw brines and mother liquors before the salt had been removed, and also after the salt had been extracted. The results of these analyses were as follows:

New York Solar Salt Company, Zilwaukee.

Sp. gr of brine, 1.1930.

Sodic chloride (salt)	.19,914
Calcie chloride	. 3.040
Magnesic chloride	1.419
Calcic sulphate	. 0.073
Calcic carbonate	. 0.0010
Magnesic carbonate	. 0.0006
Ferrous corbonate	. 0.0058
" chloride	. 0.0038
Water	. 75.041

99.498

Michigan Solar Salt Company, Zilwaukee.

Sp. gr. of brine, 1.1900.

F. B	
Sodic chloride	19.671
Calcie chloride	2.916
Magnesic chloride	1.381
Calcic sulphate	
" carbonate	
Ferrous carbonate	0.0123
Magnesic carbonate	0.0015
Carbonie acid	
Water	75.715

99.7798

Composition of mother liquors after the usual amount of salt has been extracted from the brine, as shown by various tests:

Specific gravity1.2271	1.2340	1.2432	1.2488
Sodic chloride14.203	12.228	19.685	8.989
Magnesic chloride3.856	4.741	5.360	6.174
Calcic chloride8.381	10.506	11.815	13.508
Calcic sulphate 0.023	0.023	034	.021
Water75.528	75.502	72.106	71.106
Specific gravity1.3061	1.3482	1.3709	1.4095
Specific gravity1.3061 Sodic chloride2.806	1.3482	1.3709	1.4095
		1.3709	1.4095
Sodic chloride2.806	1.890		
Sodic chloride2.806 Magnesic Chloride9.368	1.890 10.794 4.654	11.231	12.264

In 1867, a company was formed in Detroit for the manufacture of artificial stone by the Ransom patent. In the solidifying process a solution of chloride of calcium was largely used. As all the chloride of calcium then used came from England, the writer conceived the idea that the refuse bitter waters would answer the same purpose. A test was made on a small scale, resulting favorably to the use of this mother liquor. A small establishment was put up and for a year quite a large amount of crystalized chloride of calcium and magnesium was shipped to Detroit. The manufacture of the Ransom stone in Detroit was discontinued, and with this collapse the demand for the saline waste ceased.

It is believed, however, that if more attention had been paid to the careful washing of the stone after the cementing process had been completed, it would have been more successful and a demand created for the saline waste and thus a new industry established in our state. What is the quality of solution Citrate of Magnesium furnished by manufacturers? How much is gained by preparing it instead of obtaining it of the manufacturers?

A. B. STEVENS, OF DETROIT.

The first part of the query can only be answered by careful analysis. Therefore, I prepared a solution of citrate of magnesia by the U.S. P. formula from Jennings's carbonate and estimated the amount of magnesia which it contained by precipitating with phosphate of soda, igniting and weighing as phosphate of magnesia and calculating the amount of magnesic oxide present in one bottle which amounted to 5.3 grams or 81.5 grains.

A sample of carbonate of magnesia from which the solution was made was next calcined to find the amount of oxide it contained, which equaled 41 per cent. or 82 grains per bottle.

I next procured samples from all the wholesale houses in the state. The deposits which had formed in some were re-dissolved in hydrochloric acid, and the magnesia, estimated as in the previous sample:

No. 1 contained 27 grains, or 34 per cent. of required amount.

"	2	"	67	"	81	"	"	"	"
"	3	"	73	"	89	"	u	"	"
"	4	"	62	"	75	"	"	"	"

[&]quot; 5 contained a solution of tartrate of soda and potassa without even a trace of magnesia.

This fraud, though bought of a wholesale house in this city, was manufactured out of the state.

I also analyzed three samples manufactured by retail houses which attracted my attention.

No. 1 gave only a slight acid reaction and contained a deposit of three-quarters of an inch deep, gave 90 per cent. of magnesia.

No. 2 contained 83 per cent. of the required amount.

I have heard much about the wickedness of Chicago, but never saw it so well illustrated as in No. 3, which came from that city and contained no magnesia at all.

After the foregoing analysis is it a wonder that physicians regard the solution as a preparation not to be trusted? We must not infer from the fact that none contained the full amount of magnesia, that all were manufactured with fraudulent intent, but rather that some were made by a formula similar to that found on page 882 of the U. S. Dispensatory recommending the use of 75 grains of calcined magnesia, which is seven grains less than that of the U. S. P., to say nothing of the carbonic acid and water absorbed by the oxide, which varies according to the length of time it has been exposed to the air.

To ascertain the amount absorbed by various samples as found in the stores I ignited the following until they ceased to lose weight.

```
No. 1 lost 4.5 per cent.
" 2 " 7 " "
" 3 " 7 " "
" 4 " 3 " "
" 5 " 13 " "
" 6 " 15 " "
" 7 " 16 " "
" 8 " 25 " "
```

In the eight samples the loss varied from 3 to 25 per cent. No. 8 was taken from an ordinary shelf bottle, and had been in the possession of its owner so long that he had forgotten its maker. Omitting this, with its loss of 25 per cent., the varia-

tion would be reduced to 13 per cent. In the face of these figures I should hesitate some time before recommending a formula in which calcined magnesia is used, did I not fully believe that the increase in weight could be reduced at least one-half by being careful to keep the retainer open only long enough to weigh the required amount instead of leaving the cover off by the hour.

The following formula is a slight modification in strength of one published in New Remedies, page 280, year 1876:

Calcined Magnesia, (Jenning	s) grains	90. g	grams. 4.8
Citric acid,	grains,	410.	4 28.5
Sugar,	grains,	96 0.	" 52 .
Oil lemon,	drops,	2.	" .12
Water, to make,	ounces,	12.	" 360.
Bicarbonate potassa,	grains,	30.	" 2 .

Dissolve the acid in 8 ounces of water and add the magnesia. When dissolved, add the sugar previously rubbed with the oil; add water to 12 ounces or 360 grams; filter; add the bicarbonate of potassa in crystals just before corking. This formula I have used for the past nine years with satisfaction, and believe it to furnish a product superior to the U. S. P. in flavor. Jennings's calcined magnesia should always be used, as all others which I have tried deposit in a short time.

The wholesale price of solution citrate of magnesia is 16 cents per bottle. Cost to manufacture same, 12 cents, or a saving of 4 cents per bottle.

How can the Pharmacist best avoid the disadvantages of a demand for the various brands of fluid extracts?

C. S. BURROUGHS, OF CLINTON.

I can present to you no Utopian remedy for this evil, which has grown and no doubt will grow, until pharmacists are such in fact as well as in name.

The physicians are the only class we have to deal with in reference to this question. The public will not object to any brand the druggist dispenses.

A mode of procedure in one instance would not answer in another.

A pharmacist may be able to place upon his shelves a preparation, the product of his own laboratory, which will meet all the requirements of the case; he has the confidence of the medical profession.

I believe it expedient, therefore, to manufacture largely our own fluid extracts, as it can be done profitably and satisfactorily.

Crude drugs for percolation can be obtained that are reliable, if the buyer is disposed to purchase the highest quality, and with proper care in the work, preparations can be made that will compare favorably with those of the large manufacturers. I am aware the manufacturing pharmacists claim to have the means and ability at hand to pick up the best goods from first hands. This is a good argument for them, but is it a fact? I think not; the world is large, and a demand for strictly first class goods will meet with a ready supply. Therefore, I say to you, if competent, make your own fluid extracts as well as your tinctures. No one questions the druggist's ability to furnish tinctures; why should they fluid extracts? The crude material in one should be as prime as in the other.

Many may not pursue this course for various reasons, chief among which is the prejudice existing among practitioners in favor of certain brands.

Generally speaking, the physician of the least calibre is the one who is the most persistent in demanding the goods of some manufacturer, whose agent has given him the largest assortment of samples gratis, and whetted his vanity by the most urgent appeals for his support.

I know of a physician who prescribed belladonna to a patient but could get no result (so he informed the sick man) because it was dispensed at a pharmacy where he thought his favorite brand was not in stock. Imagine his chagrin when told his favorite was the only brand on hand.

Other instances of a like nature could be cited, showing that it is *prejudice* which governs the physician in some cases.

The educated practitioner does not readily take to brands whose makers claim peculiar virtues, due to the material being sugar cured or other catch-trade fallacies.

There are manufacturers, to their shame be it said, who employ patent trade marked goods as an entering wedge to the physician's favor. Such should meet with merited disapproval, if only from an ethical point of view. Charlatanry is met with in the pharmaceutical, as well as in the medical profession.

If it is not in the druggist's power to manufacture his own, then let him handle a brand recognized by the trade at large as being the best, and adhere to it as closely as possible, disregarding the absurd claims advanced by unscrupulous fluid extract makers to gain trade. Should there be a persistent demand for extracts made by some peculiar process invented by the fertile brain of the manuturer, that alone should be sufficient condemnation; not that he is entirely wrong but because it is our duty to dispense goods made in conformity to the U. S. P., the standard authority. If his mode is superior it will be time to employ his ideas when they shall have been adopted by the highest tribunal in pharmacy.

It is the physician's province to decide what remedies he will employ and the pharmacist's duty to dispense the articles answering to the highest tests of strength and purity.

When pharmacists are educated up to the standard they should attain, then the question will have been solved.

What are some of the most useful analytical tests easily made by any dispensing pharmacist, but generally neglected?

OTIS C. JOHNSON, OF ANN ARBOR.

1st.—Detection of silver in Bismuth Carbonate.

It is well known that silver chloride will dissolve in hydrochloric acid. If the latter has sp. gr. 1.19, one part of the chloride dissolves in two hundred parts of the acid.

In testing bismuth carbonate for silver, it is customary to dissolve in hydrochloric acid; if the solution is perfect, silver is said to be absent.

This, however, is not always the case, for since bismuth chloride requires an excess of hydrochloric acid to keep it in solution, this excess is likely to dissolve small quantities of silver that may be present; and further, I think I have proven that silver chloride is more soluble in bismuth chloride than in hy-

drochloric acid alone. If the bismuth compound is first dissolved in nitric acid and then hydrochloric acid added the difficulty is not obviated.

I recommend that the whole be dissolved in hydrochloric acid and then stannous chloride will throw down the whole of the silver as metallic silver while all of the bismuth will remain in solution. The equation is:

 $2AgCl + SnCl_2 = Ag_2 + SnCl_4$

2nd-A simple test for Arsenic.

The busy druggist who has little time for analysis, has frequent need of a rapid method of testing for arsenic. Such a method is found in the use of aluminium wire in alkaline solution; this converts the arsenic into arsenious hydride, AsH₃. The equation is:

 $H_3A_8O_3 + 2KOH + Al_2 = A_8H_3 + K_2Al_2O_4 + H_2O.$

The gas evolved may be rapidly tested by placing a piece of filter paper moistened with silver nitrate over the mouth of the test tube in which the experiment is being performed. If arsenic is present the paper is quickly blackened by the formation of metallic silver. Organic matter interferes less in this test than in the usual "Marsh Test."

Again, the aluminium found in the market is always free from arsenic, while zinc that is strictly arsenic free is hard to find.

3d-A test for Tin.

The tests for tin given in analytical tables, although accurate, are very long and require great experience to detect small portions. I have found the following test very delicate and perfectly characteristic. Add to the solution potassium hydrate in excess; filter if any precipitate is formed; add an ammoniacal solution of silver nitrate; if any tin is present a black precipitate is at once formed consisting of metallic silver.

The equation is:

 $2NH_4AgO + K_2SnO_2 = K_2SnO_3 + 2Ag + 2NH_3 + H_2O.$

If the tin is present as a stannic salt, it must be changed to stannous by zinc or aluminium and hydrochloric acid, completely dissolving the precipitate which is at first formed. To what extent does the Precipitated Sulphur of the Market Contain a large proportion of Sulphate of Calcium?

WM. A. HALL, OF GREENVILLE.

In investigating this subject there were analyzed in all eight samples obtained from different places in this state—three from Detroit, one from Owosso, one from Ionia, one from Big Rapids and two from Greenville.

The processes used in each case were the two mentioned in the U.S.P., '80, and one other as a kind of check on the first two.

I will briefly describe these processes. The first is what I call the carbon bisulphide (CS₂) process; 100 grains of the preparation are treated in a small flask with about one fluid ounce carbon bisulphide, and shaken at intervals until the residue does not grow appreciably less. Then the whole contents of the flask are transferred to a weighed filter, and the residue on the filter washed with carbon bisulphide until it ceases to lose weight or until a small portion of the filtrate completely evaporates at ordinary temperatures. After drying, the filter and contents are weighed, when, of course, the residue is easily found.

In the second, or sodium hydrate (NaOH) process, 100 grains are boiled with about 4 ozs. sol. soda, the mixture filtered while hot and residue thoroughly washed, first with hot, dilute (1 to 3) sol. soda, then hot water, and afterward dried and weighed.

The third process is by ignition on platinum foil.

Sample No. 1 was very nearly pure, there being only a slight residue consisting of organic matter and a trace of iron. By ignition only a trace remained.

Sample No. 2 gave a residue of 57 grains by each of the first two processes and 45 by ignition.

From sample No. 3 was obtained a residue of 59½, 56½ and 55 grains by CS₂, NaOH, and ignition processes respectively.

No. 4 gave by CS₂, process 60 grains residue, by NaOH process 62 grains, and by ignition, 50 grains.

No. 5 was prepared according to the U. S. P., excepting well water was used instead of distilled. From this sample was obtained a residue of 4 grains by CS₂ and NaOH processes, but only a trace by ignition.

These results were fairly uniform, but the last three samples were more divergent in the results as obtained by the different processes.

No. 6 gave by CS₂, NaOH and ignition processes respectively 66, 52 and 60 grains.

No. 7 gave 68, 50, 55 grains.

No. 8 gave 78, 50, 55 grains.

Seeking for an explanation of the differences in the last three samples by the first two processes, I had the following indications: The residue on igniting was yellow when hot and white when cold, characteristic of zinc, zinc hydroxide $(Zn(OH)_2)$ being soluble in sol. soda in excess would account for the smaller residue by the NaOH than by the CS_2 process.

About 200 grains of the preparation were treated with dilute hydrochloric acid (HCl), filtered and filtrate tested for zinc by sodium carbonate (Na₂CO₈) and potassium hydrate (KOH), both of which gave decided reactions. Below are the results obtained from the eight analyses by the different processes:

100 grs. take	n.	RESIDUES.		
	$\widetilde{\mathrm{CS}_2}$.	NaOH.	Ignition.	
No. 1	1	1 1	Trace iron.	
" 2	57	57	45	
" 3	59 1	56 1	5 5	
" 4	60	62	50	
" 5	4	4	Trace Iron.	
" 6	66	52	60	
" 7	68	50	55	
" 8	7 8	50	55	
Average—46	5.94 per cent.	41.62 per cent.	40 per cent.	

For verifying results, the residue by CS₂ process in No. 6 was further treated with solution soda, and this residue was the same as that obtained when the original powder was treated with the latter agent.

How nearly does the Tincture of Iodine in use conform to the Pharmacopoeial standard of strength?

ALBERT B. PRESCOTT, OF ANN ARBOR.

The Pharmacopæia of 1880 requires that the iodine shall form eight per cent. of the tincture, by weight. This is about six-tenths of 1 per cent. stronger than the standard of 1 troy ounce to 1 pint of alcohol of gravity 0.835, as directed by the U. S. Pharmacopæia from 1830 to 1870, inclusive.

As tincture of iodine is an article used all over the world, it may be of interest to compare the several standards of the pharmacopæias of other countries. The Pharmacopæial strength is 10 per cent. in Portugal and Switzerland; 9 per cent. in Germany and Russia; 8 per cent. in Belgium; 7.7 per cent. in France, Holland, and Spain; 5.9 per cent. in Austria and Hungary; and 5 per cent. in Greece, Denmark, Norway, and Sweden.† The Br. Ph. has only a compound tincture.

It has long been well known that an alcoholic solution of iodine is unstable by reason of chemical action between the iodine and the alcohol.! Hydriodic acid is formed by union of iodine with hydrogen of the alcohol. Ethyl iodide is stated to be produced in this reaction, but other products must result, and the entire reaction does not appear to have been determined. Whether under given conditions iodal is formed or not is a question of interest. At all events, the hydriodic acid, in proportion to its quantity, renders the iodine soluble in water. The union between the iodine and the hydriodic acid is scarcely a chemical one. The immediate potency of the tincture is due, of course, to its free iodine, and is diminished by the formation of hydriodic acid and ethyl iodide or other chemical compound of iodine. It is probable, however, that when an exposed surface is painted with iodine tincture, the hydriodic acid is so soon decomposed by atmospheric oxidation that the effect of the iodine of HI is substantially obtained, by its early liberation, as an application of free iodine.

The Pharmacopæia directs the assay of the tincture by the prompt volumetric operation with hyposulphite, as follows: "6.33 gm. of the tincture, mixed with a solution of 2 gm. of iodide of potassium in 25 c. c. of water and a little gelatinized starch, should require, for complete decoloration, 40 c. c. of the volumetric solution of hyposulphite of sodium." This method was substantially followed, the hyposulphite solution being standardized by a decinormal iodine solution, as the Pharmacopæia directs, and the details being governed as follows: A weighed flask of about 50 c. c. capacity, with glass stopper, was marked to measure nearly 6.33 gm. tincture of

^{——18}quire, Fifth International Pharmaceutical Congress, London, 1881.
——;Guibourt, 1846: Bull, de l'Academie de Medicine; Phar. Jour. and Trans., vi.
184. John Casthelaz, 1882: Jour. de Phar. et de Chim. (6), v., 498; Pharm Central.,
xxiii., 299; Year Book of Phar., 1882, 271. Carles, 1874; Phar. Jour. and Trans.
(3), v., 88.

Iodine. This volume of the tincture under examination was taken in the flask, exactly weighed, the 25 c. c. of solution of 2 gm. iodide were added, and the liquid titrated, adding a very little gelatinized starch when near the end, and titrating back with the decinormal solution of iodine to fix the end reaction.

Then, gm. tincture taken: 6.33::c.c. of hyposulphite minus c.c. of iodine: x. And $\frac{1}{2}$ of x = percentage of iodine sought. The following results were obtained, from samples collected from drug stores in Michigan—except Nos. 16, 17, and 18, which were obtained in Canada. The determinations were made at the School of Pharmacy of the University of Michigan, by John F. Conrad, Ph. C.

Percentage of iodine by weight is given.

reentage of fourte by weight is given.	
No. 1	Porcentage. 7.10
2	
3	6.81
4	7.35
5	6.14
6	8.20
7	4.32
8	8.95
9	5.43
10	
11	
12	6.87
13	7.11
14	7.10
15	7.06
16	
17	
18	
19	
20	6.87
21	
22	7.09
Highest,	12.38
Lowest,	2.72
Average,	7.14

These are determinations of the free iodine, and give no account of the iodine which had gone into combination in hydriodic acid and other compounds.

Cammaile (1859) has estimated that as much as 1½ per cent. of hydriodic acid is sometimes formed.

Common observation shows that the old tincture often contains enough hydriodic acid to render nearly all the iodine soluble in water. But after making all allowances for the iodine which has suffered chemical union, it is evident that far too great a diversity of strength appears among the articles of simple tincture of iodine in use. The average, however, is reasonably near correctness.

The overstrengths are noticeable, and are probably for the most part due to evaporation of alcohol in shop bottles not kept full, so that a remainder of two or three ounces in a quart bottle becomes very strong. If these remainders are carried into the next bottleful, by filling upon the old residue, then the overstrength accumulates from time to time.

Strengths of iodine tincture were reported by the A. P. A. Committee on Adulterations in 1874 (Proceed., 22, 316).

Analysis of certain Cosmetics.

FRANK M. CLARK, PH. C., SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

PROPRIETARY ENAMELS.

Dr. Felix Gourand's Oriental Cream or Magical Beautifier.— Mild chloride of mercury in suspension or deposit in water. The liquid contained a very little mercuric chloride (corrosive chloride), possibly resulting from decomposition of the mercurous chloride in the watery mixture.

Champlain's Liquid Pearl.—Oxychloride of bismuth ("pearl white") and drop chalk, in highly perfumed water.

Stoddart's Peerless Liquid.—Nearly the same as the article last above given. Oxychloride of bismuth, some preparation of chalk and water.

Hagan's Magnolia Balm.—Oxide of zinc (zinc white) in perfumed water.

Laird's Bloom of Youth, or Liquid Pearl.—Oxide of zinc (zinc white) and carbonate of calcium (as some grade of chalk) in perfumed water.

Excelsior of Beauty.—Lead white or flake white (basic carbonate of lead), drop chalk, chalk, carbonate of magnesia, and bay rum.

Youthful Tint.—Oxide of zinc (zinc white), essential waters. In another bottle, carmine and a prepared chalk.

PROPRIETARY LOTION.

Blush of Roses.—A clear liquid—rose water, common salt and a little sulphate of magnesium.

PROPRIETARY POWDERS.

Blanc de Pures.—An earthy white, probably French chalk (steatite or talc), and zinc white.

Youthful Tint.—Zinc white, starch.

Palmer's Invisible —Carmine, starch.

Of the seven proprietary enamels named, mercury compound was found in one; lead compound in one; a compound of bismuth in two, and a compound of zinc in three. Therefore five are probably harmless, and two are certainly hurtful in their effects on the general system.

Among the powders much sold, not proprietary, are flake white (a carbonate of lead) and drop chalk (carbonate of calcium). Pearl white (oxychloride of bismuth) is also sold. As a non-proprietary enamel, flake white (carbonate of lead) in bay rum is sold to some extent. Its continued use is liable to cause chronic lead poisoning.

Viburnum Lentago,—a proximate analysis.

HENRY PALMER, PH. C., SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

Synonym-Sweet Viburnum.

Part used—Bark.

Natural order—Caprifoliaceae.

Habitat—Canada to Kentucky and Georgia.

OCCURRENCE AND USES.—This drug seldom if ever occurs in commerce under its own name, but it appears under the name of Viburnum Prunifolium, and it is used by eclectic practitioners with some alleged benefit for the virtues ascribed to the last named drug.

DESCRIPTION.—The bark of the stem is in thin pieces or quills, purplish brown, warty; collected from older wood, grayish brown; the thin, corky layer easily removed from the greeninner surface, whitish, smooth, fracture short, inodorous. The root bark is yellowish brown, internally cinnamon colored, very bitter.

I give results of a partial proximate analysis according to the plan proposed by Henry B. Parsons in the American Journal of Pharmacy, for April, 1880.*

-*A continuous extraction apparatus was employed for benzole and alcohol extraction, essentially like the one (Tollens's) represented in Dragendorff's Plant Analysis, on page 100.

Moisture in green bark, 41.2 per cent.

Moisture in air dried bark, 9.5 per cent.

Ash.—Total ash, 9.7 per cent.

Soluble in water, 28 per cent. (sodium and potassium salts.) Insoluble in water, soluble in dilute hydrochloric acid, 4.5 per cent. (calcium and magnesium salts.)

Insoluble in water and dilute acid, 67.5 per cent. (sand.)

BENZOLE EXTRACT.—Total extract, 8.1 per cent.

Soluble in water (trace of bitter resin.)

Insoluble in water, and soluble in hydrochloric acid (dilute) 0.4 per cent.

Insoluble in water and acid and soluble in 80 per cent. alcohol, 2.8 per cent. (greenish yellow bitter resin.)

Insoluble in water, acid and 80 per cent. alcohol, 4.7 per cent. (Fixed oil.)

EIGHTY PER CENT. ALCOHOL EXTRACT.—Total extract, 12.3 per cent.

Portion A.—Soluble in absolute alcohol, 8.7 per cent.

- (1.) Soluble in water, 6.8 per cent. (tannin, valerianic acid and other extractions.)
- (2.) Insoluble in water, acid and ammonia, 1.9 per cent (resin.)

Portion B.—Insoluble in absolute alcohol, 3.6 per cent.

- (1.) Soluble in water, 1.1 per cent.
- (2.) Insoluble in water and dilute acid, 2.4 per cent. (resin.)

COLD WATER EXTRACT.—Total extract 5.2 per cent. (gums.)

I cannot claim the above results to be strictly accurate, but beg to offer them as the most complete I could reach, during the time at my command.

Further, I obtained results of experiments with menstrua for pharmaceutical preparations, according to the ordinary methods of maceration and percolation, at the ordinary temperature of the laboratory, and with the ordinary apparatus, using in each of the following operations 5 grammes, No. 60 powder of the bark, and procuring therefrom 15 cubic centimetres percolate, then evaporating to dryness at 100° C. (212° F.) until a constant weight was obtained.

1st. With 80 per cent. alcohol, 9.3 per cent. was extracted.

2d. With 70 per cent. alcohol, 9.15 per cent was extracted.

3d. With 60 per cent. alcohol, 9.19 per cent. was extracted.

4th. With 50 per cent, alcohol, 8.4 per cent. was extracted.

5th. With 40 per cent. alcohol, 5.8 per cent. was extracted.

The above results suggest 60—70 per cent. alcohol as the advisable menstruum for extracts or tinctures.

CONSTITUENTS.—Valerianic acid, greenish yellow resin, brown bitter principle, tannin, sugar, oxalates, fixed oil, saponin and a gum.

Examination of Volatile Oils.

ADOLPH E. MELCHER, PH. C., SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The oils were examined—first, according to the requirement of the last Pharmacopœia, and, second, for other gross adulterations.

Three samples each of the following oils were examined: lemon, peppermint, bergamot, wintergreen and sassafras.

One set of samples was obtained from a wholesale house in New York, and the other two sets from retail drug dealers in Ohio.

The following table shows the results which were obtained in examining according to the Pharmacopæia:

	Lemon.	Pepper- mint.	Berga- mot.	Winter- green.	Sassa- fras.
Color	pale yel.	colorless.	greenish.	pale yel.	yellow.
Color 32	green yel.	yellow. pale yel.	**	reddish. pale yel.	**
	neutral.	neutral.	slig'ly acid	slig tly acid.	neutral.
Reaction $\frac{3}{2}$::	**	"	"
(1	.850	.902	.870	1.17	1.04
Specific gr. \(\begin{pmatrix} 1 2 \ 3 \ 3 \end{pmatrix}	.852	.909	.870	1.17	1.07
	.855	.910	.870	1.17	1.06
Bolubility (1	17	1—1	1-4	12	1-2
in alco- 2	1—7	11	1	12	1-2
hol (.822) (3	1—ŏ	1-1	1{	1-2	1-2

All oils may contain fixed oils, alcohol and turpentine. Besides these adulterants, the volatile oils under examination may contain (as considered in this inquiry) as follows:

Lemon Oil.—Essential oil of lemon obtained by distillation. Peppermint Oil.—Erigeron and pennyroyal.

Bergamot.—Essential oil of bergamot obtained by distillation.

Wintergreen Oil.—Chloroform, sassafras.

Some claim that oil of birch is being substituted for wintergreen oil. Full accounts of its manufacture and chemical composition are found in the Am. Journ. Pharmacy, vol. 54, p. 491, and vol. 55, p. 385.

Sassafras Oil.—Chloroform.

Essential oils are frequently adulterated with fixed oils. Oils thus adulterated leave upon bibulous paper a greasy spot, which remains after long continued heating. Sometimes the essential oil itself leaves a similar spot, which is due to the resinification of the oil; if this spot is treated with alcohol and then heated, the stain will gradually disappear, while the fatty stain cannot then be removed. Various other methods have been proposed for the detection of these oils—the chief test being that by means of alcohol (a test that cannot be applied to castor oil) and that by the alkaline saponification of fixed oils, the volatile eil being removed by distillation before the saponification.

For alcohol, only one test was used, viz: add to 15 or 20 drops of the oil, in a test tube, some dry tannic acid (in lumps), shaking, and letting it stand for at least three hours in a warm place. In the presence of alcohol the acid becomes a soft resinous mass or even a liquid; in the absence of alcohol the acid

floats and remains unaffected. (Pharm. Centralhalle, vol. ix., p. 296.)

For oil of turpentine the following tests were applied, viz:

- (a) The alcohol test, which depends upon the fact that oil of turpentine is but sparingly soluble in it.
- (b) Pour about 10 c. c. of the oil under examination into a cylinder (not too narrow); now blow gently a current of air upon the surface of the oil, through a tube which has the shape of the letter s. In the absence of oil of turpentine, the surface will not become covered with a whitish film. But if it is present the surface of the oil becomes covered with this film, which is then gradually drawn in fine lines into the liquid. (Pharm. Centralhalle, vol. ix., p. 296.)

Those oils whose specific gravities are heavier than water are occasionally adulterated with chloroform.

The presence of chloroform is easily detected by heating some of the oil in a test tube at 55° C., when the odor becomes perceptible.

American oil of peppermint is very liable to be contaminated with oil of erigeron.

Oil of erigeron is said to be detected as follows: (a) with a cold concentrated solution of caustic potash—the oil is not saponified—but an orange red color is produced; on heating it is changed to a purple.

(b). A turbid mixture results when equal parts of oil and alcohol are mixed.

For oil of pennyroyal in the presence of oil of peppermint, the following test was applied, viz: Mix one part of chloral hydrate with one-half part of concentrated sulphuric acid, then add, stirring, a few drops of alcohol until a clear mixture is obtained. Add a few drops of this reagent to the oil under examination. If oil of pennyroyal is absent a fine cherry red color is produced. If present a dark olive green color is said to be obtained, according to the amount of pennyroyal present. (Druggists' Circular, Vol. 19, page 163.)

For oil of sassafras in the presence of wintergreen oil, the following test was applied, viz: Oil of sassafras when treated

with nitric acid (0.20) slowly produces a dark red resinous mass, but more quickly when slightly heated. In applying this test care must be taken, as wintergreen oil will give a blood or cherry red color with strong nitric acid.

The essential oils, which are obtained by pressure, or other mechanical means, are often adulterated with the same oil as obtained by distillation. These oils possess a very inferior fragrance as compared to the true oil. (Fluckiger & Hanbury, pg. 119.) They are best detected by carefully noting the vapors as given off from bibulous paper.

From a careful examination by these methods, I can see that these samples compare favorably with the requirements of the Pharmacopæia, and furthermore, that they did not contain any gross adulterations.

Aromatic Spirit of Ammonia.

A. GERTRUDE FLANDERS, PH. C., SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

The different officinal compounds bearing this name are prepared upon one of two general plans, either by distillation or by simple admixture of the several ingredients without distillation. It is yet an open question which of the two is the better process.

In 1883 Dr. J. C. Thresh gave a brief history of this preparation (Phar. Jour. and Trans., vol. 13),—from which it appears that as early as 1721 an aromatic spirit of ammonia appeared in the "Pharmacopæia Londinensis," which was prepared by distillation; during the next century and a half (nearly) the method of preparation was varied from time to time, but distillation was not discarded.

In the Edinburgh Pharmacopæia of 1722 occurs "Spiritus Salinus Aromaticus," prepared by distillation, as were all other subsequent preparations of that pharmacopæia.

In the Dublin Pharmacopæia, a "Spiritus Ammoniæ Aromaticus" appears for the first time in 1807; this was made by distillation, but in 1850 this method was discarded for a preparation made by solution.

At the present time there are three leading pharmacopæial processes, that of the British Pharmacopæia, which employs distillation, and those of the United States and Belgian Pharmacopæia, which are made without it. There is an official method in the French Codex, which, Dr. Thresh says, in the article already mentioned, is unscientific and yields a defective product, hence has been discarded by all other pharmacopæias.

The question to-day among leading pharmacists regarding this preparation seems to be, whether one can dispense entirely with distillation and obtain an article equally good. Much has been said for and against it and many experiments have been tried.

The chief objection to the process of both the United States and Belgian Pharmacopæias is, that although an article of definite strength is obtained by keeping, the spirit becomes discolored and the aroma of such a sal-volatile is not so fragrant as when prepared by distilling the spirit and essential oils together.

I do not understand, from authorities consulted, that the discoloration is at all objectionable, except as regards appearance.

On the other hand, those who oppose distillation argue that compounds prepared in this way lack consistency in strength. From the unavoidable escape of carbonic anhydride, the distillate contains an excess of free ammonia, thus giving it an undue causticity and a deficiency of carbonate. The variable products obtained make the process of the Br. Ph. open to criticism.

It would appear according to two quite trustworthy authorities,—Mr. Tanner, in vol. 13 ['83—'84] pg. 674 of Phar. Jour.

and Trans., and Dr. Thresh—that the compilers of the Br. Ph. had intended that the finished product should contain 8 per cent. of normal ammonium carbonate and no free ammonia. But after working with small quantities and distilling carefully, only four per cent. can be found; the other four per cent. having been disassociated, its ammonia existing as free ammonia in the distillate and its carbon dioxide having disappeared.

Dr. Thresh makes a statement (in Pharmaceutical Journal and Transactions ['80-81] vol. 2,) to the effect that among nineteen samples analyzed, the amount of free ammonia varied from .601 to nearly three times that quantity, while the normal ammonium carbonate varied from .248 to 3.995, or, in other words, one sample contained more than sixteen times as much of the carbonate as another, while the relative proportions of free ammonia to the carbonate varied almost to the same extent.

In my work in the laboratory I have made no attempt to ascertain the chemical composition of any of the compounds, so can speak only of their comparative merit as regards appearance.

I have prepared eleven different samples; in some following the exact requirements of the Pharmacopæia, or a special formula; in others varying slightly, in detail, from such formula.

The first three were made according to directions in the U.S.P.

Carbonate of ammonium, 40 parts; water of ammonia, 10 parts; oil of lemon, 12 parts; oil of lavender flowers, 1 part; oil of pimenta, 1 part; alcohol recently distilled and which has been kept in glass bottles, 700 parts; distilled water, a sufficient quantity to make one thousand parts.

To the water of ammonia contained in a flask add one hundred and forty parts of distilled water, and afterward the carbonate of ammonium, reduced to a moderately fine powder. Close the flask and agitate the contents until the carbonate is dissolved; weigh the alcohol in a tared vessel of suitable capacity; add the oils, then gradually add the solution of ammonium carbonate, and afterward enough distilled water to make

the product weigh one thousand parts; lastly, filter the liquid through paper, in a well covered funnel.

Although I endeavored to exercise the greatest care in their preparation, I did not succeed in obtaining a colorless liquid by this (the U. S. P.) process.

In the first sample, ordinary distilled water and common alcohol were used; in the second, re-distilled alcohol with ordinary distilled water, and in the third, both the water and alcohol were re-distilled.

Distillation was employed in the fourth, the directions of the Br. Ph. being closely followed.

Carbonate of ammonia, 8 ozs.; strong solution of ammonia, 4 f. ozs.; volatile oil of nutmeg, 4 f. drms.; oil of lemon, 6 f. drms; rectified spirit, 6 pints; water, 3 pints; mix and distil, 7 pints.

A clear, colorless solution was the result, in appearance, greatly superior to the others.

The fifth sample was prepared by a special formula suggested in the article written by Dr. Thresh. On account of the lack of constancy in strength he most unhesitatingly condemns any process necessitating the distillation of the ammonium carbonate with the spirit and gives a formula which he thinks will supersede the present one of the Br. Ph.

Take of-

 Oil of lemon,
 6½ f. drachms.

 Oil of nutmeg,
 4½ f. drachms.

 Rectified spirit,
 6 pints.

 Water,
 3 pints.

Distil 7 pts; set this apart; then continue the distillation until 9 f. oz. more have been collected; then take of—

Carbonate of ammonia, - - 4 f. oz.

Strong solution of ammonia, - - 8 f. oz.

The last portion of the distillate, - 9 f. oz

Place in a bottle holding a little more than a pint; cork securely, and place the bottle in a water bath at about 140° F., shaking from time to time until all the salt has dissolved. When cold, filter if necessary through a little wool and pour into it gradually the 7 pints of distilled spirit.

In appearance it resembles the preceding sample, being clear and colorless; but, quoting the words of the author of the formula, it is not so strong as it is possible to make a spirit of ammonia by the official process, but is considerably above the average strengths of the sal-volatiles of commerce.

Mr. C. R. Tichborne has given (in vol. 31, pg. 466 of the American Journal of Pharmacy,) a special formula in which he claims to be able to obtain a colorless solution, and one which will remain colorless for an indefinite length of time without distillation. The ingredients used are the same as those of the U. S. Ph. with one exception, oil nutmeg being substituted for pimenta.

Rectified spirits,	1 pint.
Carbonate of ammonium, (powdered)	d oz.
Solution of ammonia, sp. gr., .880,	$ar{2}$ f. oz.
Oil of lemon,	3 f. dr.
Oil of nutmeg,	1 f. dr.
Oil of lavender,	20 drops.
Water, a sufficient quantity to make	2 pints.

In my sixth, I worked by this formula, but was entirely unable to prove his statement true. Filtering through calcium phosphate was necessary before a clear solution could be obtained, and this filtrate was quite highly colored.

The seventh sample was one in which the formula of the Br. Ph. was used, but no distillation employed, and for the eighth a U. S. Ph. spirit was subjected to distillation. As in all previous trials, a clear, colorless solution was the result of distillation; a colored mixture, when distillation was not employed.

In the ninth and tenth I again made preparations by the Br. and U. S. Pharmacopœias but interchanged the oils. The eleventh was like the tenth, with the single exception that ordinary alcohol was used instead of re-distilled. These samples were all more or less colored.

The only conclusion, then, at which I can arrive, after my few experiments, is this, that distillation seems to be necessary for obtaining a colorless spirit of ammonia, and, if appearance is to be the standard by which its worth is to be estimated, this process will give the most desirable article for the market.

Criticism of the requirements of the German Pharmacopoeia for "Podophyllinum."

A. B. LYONS, M. D., DETROIT.

• The German Pharmacopæia gives the following description of Podophyllin (Podophyllinum), introduced for the first time in its last edition:

"Podophyllin, precipitated by water from an alcoholic extract of the rhizome of Podophyllum peltatum, is in the form of a yellow powder, or of light, friable lumps of a yellowish or tawny gray color, which, examined under the microscope, are seen to be amorphous.

"Podophyllin at a temperature of 100° [C.] gradually darkens in color, but does not actually melt. When shaken vigorously with water and then filtered [sic.], it furnishes a solution which is colorless, of a bitter taste, neutral to litmus, and on the addition of perchloride of iron takes on a brown color; on addition of solution of subacetate of lead, this solution becomes yellow, and gradually clouded; after a few hours flakes of a reddish yellow color separate.

"Podophyllin forms with one hundred times its weight of water of ammonia [sp. gr. 0.960] a solution of a yellowish brown color, which is not rendered turbid by the addition of water;

on neutralizing the ammoniacal solution, brown flakes are thrown down. Dissolved in ten times its weight of alcohol, podophyllin produces a very dark brown liquid from which water precipitates grayish brown flakes.

"Podophyllin is only partially soluble in ether, and still less so in carbon bisulphide."

No process is given, in detail, for the preparation of this article, which is not designated as in the U. S. and French pharmacopœias "Resin of Podophyllum." A process is given, however, for preparing "Resin of Jalap," together with a brief description. One cannot help noting the contrast between the two descriptions, the one encumbered, it would appear, with uncessential minutize, the other confined to the truly characteristic peculiarities of the substance, and asking whether the difference can have any significance or explanation.

Resin of podophyllum, prepared in the manner outlined in the German Pharmacopæia, and given in detail in the French, and (with slight variations) in the American, does not answer in certain particulars to the description given of "podophyllinum." There is in the market, however, in Germany, a product which does answer to this description, and the conscientious German apothecary must therefore refuse to accept foreign podophyllin, unless made by some modified process to conform to the requirements of their pharmacopæia.

The complaints made of foreign podophyllin in the German market are, that it is not of the right color, and that it is not completely soluble either in alcohol or ammonia. Frequently the aqueous solution fails to produce with ferric chloride the required dark color, and the proportion of inorganic matter contained in the podophyllin often exceeds the limit of one per cent. stated by Hager.* American podophyllin is generally of a bright yellow color, although this is not true of the article when prepared by the official process. The yellow color is produced by the use of alum in the precipitation of the resin. It is said that a larger yield of podophyllin is obtained when alum is used, and this may be the true secret of the alleged "popu-Pharmacoutische Praxis.

larity" of the yellow products. Whether there is any material difference in activity between the yellow and the fawn colored podophyllin, I cannot say, but I believe the proportion of podophyllotoxin is about the same in both. The yellow product, however, contains a notable amount of alumina, which accounts for the large proportion of ash it leaves on ignition.

Resin of podophyllum, "prepared by precipitating an alcoholic extract of the drug with water," does not dissolve completely in ten times its weight of alcohol, or in one hundred times its weight of water of ammonia; at least, none I have ever examined has answered this implied requirement of the German Pharmacopæia. Even when the resin has been repeatedly dissolved and precipitated, it remains incompletely soluble, owing, it would seem, to some change taking place in it during the drying.

The researches of Podwyssotski have shown that resin of podophyllum contains:

1st.—An inert oily substance, soluble in petroleum ether, as well as in chloroform, ether and alcohol, to which the peculiar odor of the drug is due.

2d.—A substance (podophyllinic acid) soluble in chloroform, but not in ether.

3d.—A substance (podophyllo-quercitrin) soluble in ether, but insoluble in chloroform. All these substances, making up together fifty or sixty per cent. of the "resin," are inert.

Finally, 4—There is a substance readily soluble in chloroform and ether, but insoluble in petroleum ether, which may
be regarded as the active constituent of the resin. This Podwyssotski calls podophyllotoxin. Now, the soluble German
podophyllin differs from the resin of podophyllum (U. S. P.) in
that it contains scarcely any of the constituent soluble in petroleum ether. Whether the proportion of podophyllotoxin is
greater than in the ordinary resin I am not prepared to say,
but the distinctions of solubility in alcohol or in ammonia are
quite independent of this question.

It is possible to prepare a podophyllin agreeing with the German product, by extracting the oily matter, either from

the crude drug, or from the resin by means of petroleum ether; very possibly there are other means of accomplishing the same end. Such a treatment, as it happens, will incidentally increase the strength as it will also materially enhance the cost of the product. Whether the harshness of its action will be modified is a question to be settled only by physiological experiment.

Resin of podophyllum, prepared in the usual manner, if shaken with water, yields a solution nearly or quite colorless, which frequently shows no darkening of color on the addition of ferric chloride. The alcoholic solution in any case gives an intense brown color with the reagent (due to the podophylloquercitrin). It is a curious circumstance that the same resin, after treatment with petroleum ether, gives an aqueous solution which is colored more or less strongly by the ferric salt.

It thus appears that the tests of the German Pharmacopæia are either hypercritical, or else they have an esoteric significance into which it may not be profitable for us to inquire. The U.S. Pharmacopæia fixes the strength of the Tincture of Nux Vomica by the amount of extractive matter it contains.

To what extent does this secure uniformity in the product?

A. B. LYONS, M. D., OF DETROIT.

The subject of nux vomica and its galenical preparations has been ably dealt with, within the past two years, in England, by Messrs. Dunstan and Short, who have presented before the British Conference a series of exhaustive papers that furnish abundant material for framing a reply to the above query. My own somewhat extended opportunities for observation enable me to supplement this material with corroborative and additional facts.

We may first of all inquire whether there was occasion for such a radical change as was made in the last revision of our Pharmacopæia in the method of preparing this tineture. That the drug was one presenting unusual difficulties in exhaustion every one knows. The tough, horny structure of the seeds resists alike the action of all ordinary comminuting apparatus and the persuasive influence of solvents applied in any ordinary manner. Aside, therefore, from original differences in the alkaloidal strength of different samples of the drug, there is good reason to expect to meet with variation in a tineture prepared by "exhausting" a given quantity of drug with a stated amount of menstruum.

The difficulty of completely exhausting nux vomica, and the consequent uncertainty in strength of all preparations which purport to represent a definite quantity of drug, simply, has received a new illustration in the results recently reported by Mr. Coblentz to the examination of a number of samples of abstract nux vomica. This preparation is supposed to be of just twice the strength of the crude drug. Mr. Coblentz found that the proportion of alkaloid obtained from the seeds was as follows:

In No. 1, seeds had yielded 0.94 p. c. alkaloids.

"	"	2,	"	"	ш	1.56	"	"
"	"	3,	"	"	6.	1.12	"	44
"	"	4,	"	"	44	2.31	66	"
"	"	5,	"	"	"	2.98	"	"
"	"	6,	"	"	66	1.76	"	"
"	"	7.	"	"	66	0.99	"	"

That any such differences as this existed in the seeds, we cannot believe; but it is clear that a better result could be secured by diluting the solid extract than has been practically obtained by following the official formula.

Comparatively few assays of nux vomica have been published. Until recently there has been no simple, easy method of estimating the total alkaloids, and the separation of strychnine from brucine had been considered impracticable in assays. Messrs. Dunstan and Short have however solved for us both of these problems, and the writer of this paper has also independently worked out a method of assay, published last year in the Druggists' Circular, which for ease and rapidity of execution he still believes to be unsurpassed.

Dragendorfft gives the results of only a few assays, stating that the drug contains from 1.65 to 2.82 per cent. of total alkaloids, of which 50 per cent. may be assumed to be strychnine.

Messrs. Dunstan and Short § found in the Bombay nux vomica, 3.14 to 3.9 per cent of alkaloids; in the Cochin variety, 3.04 per cent. to 3.6 per cent.; in the Madras variety, 2.74 to 3.15

[—] Pharmaceutical Record, Sept. 22, 1886, p. 289.

- Werthbestimmung einige Starkwirkender Droguen.

- Pharmaceutical Journal and Transactions, Feb. 17, 1883.

per cent. Mr. Shenstone ¶ obtained from the seeds about 2.25 per cent. of total alkaloid.

Among my own records I find assays of twelve specimens of nux vomica, containing respectively 2.68, 3.11, 2.70, 2.70, 3.13, 3.09, 3.47, 3.16, 4.89, 3.10 and 2.70 per cent. of alkaloid.

The differences shown by these assays in the strength of the drug itself are so considerable that, aside from any other cause of variation, tinctures prepared from them in the usual manner could have no uniformity of composition or of therapeutic efficiency.

Examination of the tinctures actually dispensed in England showed that the strength varied between 0.124 and 0.360 per cent, of total alkaloids.

The following are the figures given by Dunstan and Short:

No. of speci- men.	Per cent. total alkaloids.	Per cent. etrych- nine.	Per cent. of strychnine in total alkaloids.
1	0.224	0.077	34.4
2	0.262	0.097	37.0
3	0.208	0.068	32.5
4	0.124	0.049	39.4
5	0.360	0.121	33.6
6	0.211	0.084	39.8
7	0.136	0.046	33.3
8	0.181	0.066	36.5
9	0.196	0.077	39.1
10	0.189	0.087	46.0
11	0.168	0.060	40.5
12	0.263	0.131	49.9

My own assays of fluid extracts of nux vomica show still more startling variations. In six samples, from several manufacturers, I found in 100 c. c., respectively, 0.88, 0.60, 1.15, 1.6, 1.35 and 0.75 grams of total alkaloids. The best of these samples contains little more than one-half the quantity of alkaloid found in a drug of average strength. Indeed, I may say, incidentally, that a fluid extract representing the drug from which

^{——¶} Journal Chemical Society, xxxix., 453.
—— Pharmaceutical Journal and Transactions, Oct. 18, 1888.

it is made in the proportion of cubic centimeter for gram is hardly practicable by any process not involving concentration of the product by heat. Such variations as these certainly call for some remedy. The preparations of this drug must be adjusted to some standard of strength; what one should we adopt?

The U. S. Pharmacopæia has decided to standardize the tincture at least, upon the proportion of extractive it contains. Unquestionably this is a step in the right direction. But does it accomplish in reasonable measure the objects at which it aims? This depends on whether the extractive itself contains a tolerably uniform proportion of alkaloid.

Messrs. Dunstan and Short * give the results of assays of twelve samples of commercial extract of nux vomica containing, in the dry state, respectively:

No. 1	18.18	per cent.
 2		" "
" 3		"
" 4	21.40	"
" 5	18.40	"
" 6	18.94	"
" 7	19.67	"
" 8	20.36	"
" 9	12.21	"
" 10	14.87	"
" 11	14.60	"
" 12	14.28	"

Mr. Coblentz has recently examined seven samples of abstract of nux vomica with the following results:

		Per cent. extractive.	Per cent.	Per cent. alkaloid in extractive.
No.	. 1	10.96	1.88	17.15
"	2	23.72	3.12	13.16
"	3	20.62	2.24	10.89
"	4	21.26	4.62	21.73
44	5	38.86	5.96	15.34
"	6	27.80	3.52	12.66
"	7	15.26	1.98	12.98

^{----*}Pharm. Journal and Transactions, Dec. 8, 1883.

From my own records I take the following, being the proportion of total alkaloid to dry residue from samples of fluid extract nux vomica:

No. 1	Per cent. 19.5
2	
3	14.5
4	16.2
5	21.0
6	14.9
7	16.5
8	16.9
9	14.8
10	14.3
11	21.3
12	2 1.6
13	15.0
14	20.2
15	19.2
16	22.7
17	20.0
18	17.5
19	20.4
20	21.8
21	19.4
22	15.2
23	19.9
24	21.4
25	20.4
26	24.2
27	18.6

The following, also from my own records, are results of assays of samples of solid extract (of pilular consistence, containing the usual proportion of water):

No. 1	Per cent. 12.8
	18.2
3	

No. 4	Per cent.
5	
6	13.6
7	15.2
8	11.4
9	
10	
11	
12	
13	
14	14.8
15	
<u>16</u>	
17	
18	
19	
20	15.5

In both these series, the extract has been obtained by the use generally of the same menstruum, and yet there are variations so considerable that one sample may be said to be nearly double the strength of another.

The cause of these variations is believed to be partly inherent in the nature of the drug, some samples yielding to the same menstruum a larger proportion than others of inert extractive, partly also to the degree of fineness of the powder, but chiefly perhaps to variations in the amount of moisture present in the drug. A number of experiments have been made by the different observers to ascertain the influence on the proportion of alkaloid in the extract, of variations in the strength of the menstruum employed. Messrs. Dunstan and Short † report a series of experiments made to ascertain what menstruum most completely exhausts nux vomica. The following are their results:

	Sp. gr. of menstruum.	Volume per cent. of com- mercial alcohol.	Per cent of alkaloid ex- tracted from drug.
No. 1,	0.9452	47.0	1.85
" 2,	0.9240	58.8	2.15
" 3,	0.9160	62.6	2.22
" 4 ,	0.8990	70.6	2.26
" 5,	0.8891	75.0	2.26
" 6,	0.8380	94. 0	1.95

--- †Pharm. Journal and Transactions, Dec. 8, 1888.

In each case the same amount of menstruum was used, the powdered drug being simply macerated in it for a specified length of time. It would appear from these experiments that a spirit containing 60 to 75 per cent. by volume of common alcohol was that to be selected for a tineture or fluid extract of this drug. The amount of extractive obtained was unfortunately not noted.

Mr. Conroy ‡ gives the results of a similar series of experiments, more complete for our present purpose, as follows:

ž..

1.50

2.20

0.920 0.882 0.838 0.830 0.820	com. alcohol. 20	13.50 13.50 10.56 10.56 9.57 8.03	15.45 15.83 18.00 12.44 10.09	081 060 11.10 081 081 081 081 081 081 081 081
0.795	abs. alc.	7.48	4.28	0.31
	own notes I			
gr. of menstruum.	cont. (volume) of com. alcohol.	cent. of extract from drug.	Per cent. of alkaloid in dry extract.	for cent, of alkaloid extracted from drug.
á.	5 0	ង្គី 14.1	Per	2.21
0.9400			16.6	
0.9080	67	13.5	19.3	2.60
0.8891	7 5	12.1	15.0	1.82
		~ ~	400	

Comparing these independent series of observations, we find all agree in showing that alcohol of a strength greater than 80 or 85 per cent. (vol. of commercial alcohol) is not suited for the

8.3

6.9

18.6

32.0

90

100*

0.8508

0.8200*

extraction of this drug. On the whole, they coincide in indicating as the most suitable menstruum a mixture of one volume of water with two of alcohol. This menstruum would be safer, certainly, than that recommended by most authorities, including our own Pharmacopæia, because slight variations in the strength of the spirit or in the amount of moisture present in the drug itself would have comparatively little influence.

In practice it has been found accordingly that with this menstruum, the quantity and quality of product (solid extract) have been more uniform than when a stronger menstruum has been used. The oily constituent of the seeds is not taken up to any great extent by a spirit of this strength, and the proportion of alkaloid contained in the product has been very constant, ranging (the extract being in the moist condition) from 14.5 to 15.5 per cent. (in one instance, only, 16.3 per cent.).

The only serious discrepancy we find in the results of these observations relates to the action of a spirit of somewhat greater strength (3 volumes alcohol with one of water.). Dunstan and Short find this the best menstruum of all. Conroy's observations would show that it is about as good as any. My own single experiment seems to show that proportionately more inert matter may be taken up from the same drug by a spirit of this strength than by one either stronger or weaker. Possibly the discrepancy was due to the use in my experiments of a coarser powder than that employed by Messrs. Dunstan and Short.

The remarkable influence of ammonia in aiding the solution of the alkaloids is shown in the final experiment in my own series.

The conclusion to be drawn from these several series of experiments is that, so long as the present menstruum is employed for making the tincture of nux vomica, we may expect that there will be wide variations in the alkaloidal strength of the preparation, standardized as it is by its content of extractive, and we may also expect to find our yield of standardized tincture disappointingly small.

I have not yet seen the revised British Pharmacopæia, which has just been published, and I do not know what has been done with regard to this tincture. Strong efforts were made, I know, to introduce an alkaloidal standard of strength. Messrs. Dunstan and Short proposed to make the tincture contain in each fluid ounce, imperial, 1 grain of total alkaloid; and if any standard has been adopted, it is probably this one.

The tincture would be a little weaker, probably, than that of the U. S. Pharmacopæia, which contains in each fluid ounce, imperial, about 7.44 grains of dry extract, or not far from 1.25 grains of total alkaloid (1.12 to 1.49). It is to be hoped that the next revision of our Pharmacopæia will aim at approximating our standard to that of the British Pharmacopæia, provided some simple alkaloidal standard has been adopted by that authority; otherwise, that it will set an example by anticipating the British in adopting the simple standard that has been urged upon them.

I am very strongly in favor personally of adopting for all the preparations of nux vomica an alkaloidal standard of strength. It is most important of all in the fluid extract, which as now made contains generally less than 50 per cent. of the proportion of alkaloid present in an average sample of drug. It is certainly as easy to adjust the strength of a preparation to the alkaloidal standard as to such a one as we now have for our tincture. The assay is exceedingly simple and requires no special appliances.

One argument has been urged against the adoption of the proposed standard, and it is one that has a certain degree of cogency. It is this: Nux vomica contains at least two distinct alkaloids, only one of which deserves to be called its active principle. A varying proportion of the alkaloid consists of the comparatively inert brucine. If we are to have a standard worthy of the name, should it not be the alkaloid strychnine? Before replying to that question, we must settle, if possible, several points. Is it true that strychnine alone, or chief ly, is the active constituent of nux vomica? Granted that it is so, does the proportion of strychnine in the mixed alkaloids

^{——†} The above mentioned standard has in fact been adopted in the revised British Pharmacopœia, and the Extract of Nux Vomica has also been adjusted to a fixed standard of strength, viz: 15 per cent. total alkaloid.

vary so greatly as to render it necessary to estimate that proportion in order to judge of the therapeutic value of the mixture? To the first of these inquiries we can only reply, although the demonstration is not complete, it is highly probable that to strychnine almost wholly is due the activity of the drug.

The second inquiry is partially answered by the results of a number of analyses reported by Messrs. Dunstan and Short. In twelve samples of tineture nux vomica, they found the proportion of strychnine in the total alkaloids to vary between 33 and 50 per cent. In the same number of samples of solid extract, the range was from 35.8 to 50.1 per cent.

The average in the former case was 38.5 per cent., in the latter 42.65 per cent. We are to conclude, therefore, that a standard based on quantity of total alkaloid permits a possible variation in strength of fifty per cent. of the lower value. We admit the force of the objection, and reply that we only urge the adoption of an alkaloidal standard as a great advance upon our present method, which again is a distinct advance over the good old rule of thumb process. We cannot hope to reach the goal of perfection in pharmacy or in any other art except by successive easy steps. As soon as we have found how easy it is to take the first of a series of steps, we gain courage to essay the second, and we are ready then for the next succeeding.

The idea of a standard for tincture nux vomica has been made familiar; we see how easy it would be to improve on the standard by substituting "total alkaloids" for extractive; and many pharmacists will have the courage to attempt the simple chemical operation of separating the total alkaloids, if they see that the process is really a simple one, who would not venture to meddle with so difficult a chemical problem as the isolation in pure form of the single alkaloid strychnine. We must creep before we can stand, and learn to stand before we can walk, but let us not creep forever because we despair in the outset of being able to co-ordinate the action of our muscles in the performance of gymnastic exercises.

The progress we have made, and that we hope hereafter to make, may be reduced to a mathematical expression something like this: Suppose brucine to act in a similar manner to strychnine, but to have only one-fifth its energy of operation. Of two samples of nux vomica containing the same quantity of total alkaloids, of which in one case strychnine formed one-third, in the other one half, the relative value of the two would be 7:9 or 1:1.286. These figures would represent the range of variation in preparations of nux vomica standardized upon their content of total alkaloid. Suppose our standard to be based on extractive, and that this may vary, as we have seen it does, in the proportion of alkaloid it contains, from 15 to 23 per cent. Combining the two ratios, we find the possible variation in strength of tinctures standardized in the present method, 105:207 or 1:1.96+.

We have seen that without any standard whatever, the variation in alkaloidal strength reaches a ratio of 1:3, which by combination with the first ratio gives us 7:27 or 1:3.86, representing the variability of an unstandardized tincture. We have advanced from this last ratio of 1:3.86 to the more satisfactory one of 1:1.96. By judicious modification of the formula, we may reduce this ratio considerably. If, for example, we choose a menstruum which will give us an extractive that shall vary only between 14 and 16 per cent. in its alkaloid content, the ratio will become 49:72, or 1:1.47. A distinct gain will be made, however, over even this improvement, if in place of the amount of extractive we adopt that of alkaloid for our standard, making the modulus of variation, as already stated, 1:1.286.

Criticism which is merely destructive is useful only as affording a foundation for better future construction. I cannot, therefore, close this paper without offering definitely a substitute for the formula of the United States Pharmacopæia, and this task I find made very easy, since it is only necessary to quote with slight modification the formula suggested by Messrs. Dunstan and Short.*

Take of Nux vomica, in No. 60 powder, 20 parts.

Alcohol, water, each a sufficient quantity.

Mix alcohol and water in the proportion of ten (10) parts of alcohol to six (6) parts of water, moisten the powder with

— Pharm. Journal and Transactions, Feb. 9, 1884,

twenty (20) parts of the mixture, and macerate twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it until the nux vomicais exhausted. Reserve the first ninety (90) parts of the percolate, evaporate the remainder to ten (10) parts, and mix with the reserved portion. Of this tincture take a convenient quantity (e. g. 25 c. c.) and estimate in it the total alkaloid in the following manner: Evaporate nearly to dryness on a water bath, add to the residue in the capsule 1 c. c. of dilute sulphuric acid with 15 c. c. of water and 15 c. c. of ether. Pour the dissolved extract into a bottle capable of holding about 60 c. c., and rinse the capsule with several successive small portions of water and ether. Shake the mixture well together (not too violently) and allow the fluids to separate. Draw off the ether, which contains only impurities, add 25 c. c. of other, shake as before and when the fluids have separated remove the ether. Repeat this operation a third time, using in place of pure ether a mixture of one volume of chloroform with three of ether, which is to be rejected as before. Add to the washed aqueous solution 30 c. c. of the same mixture of chloroform and ether, with an excess of water of ammonia, shake the mixture, and, when the fluids have completely separated, remove carefully the ethereal fluid, which now contains the alkaloid, to a tared capsule. Wash the residual aqueous fluid with a second portion (20 c. c.) of the ether mixture, and add this also to the first portion, evaporate over a water bath, and dry at 100° C. (212° F.) one hour. When cool, weigh the residue, which consists of the total alkaloid from the portion of tincture used. Calculate the alkaloid in the entire amount of tincture, and add enough menstruum to make a product which shall contain in 1,000 parts three parts of alkaloid (or, preferably, which shall contain in 1,000 fluid grains, three grains of alkaloid.)

It is of course equally important to have the fluid extract of a definite alkaloidal strength, especially since so many pharmacists employ this in preparing their tincture. When this practice is followed, I may say, parenthetically, the tincture, if made according to the requirements of the Pharmacopoeia to contain 2 per cent. of dry extract, is likely to be of exceedingly

variable strength, since the proportion of alkaloid to inert extractive varies even more in fluid extracts as made by different manufacturers, than in different samples of the tincture prepared according to the instructions of the Pharmacopæia. It is not easy to prepare a fluid extract which shall contain a proportion of alkaloid approaching that found by assav in nux vomica. The fluid extracts in the market fall far below this standard of strength, and I believe it is practically impossible to exhaust the drug completely by any of the processes commonly employed in making fluid extracts. I have with some hesitation adopted the view that this fluid should be adjusted to a standard considerably lower than that of the drug, and would propose that this standard be made 1.5 per cent of the weight of drug employed. Such a preparation is of course rather a saturated tincture than a fluid extract, and it would perhaps be as well to designate it by some other name than that of fluid extract, to which a definite meaning is attached.

For a standard solid extract, the strength proposed by Messrs. Dunstan and Short, viz.: 15 per cent. total alkaloids, is no doubt the best that could be adopted, and this, in concluding this paper, I reproduce * as follows:

Take of:

Nux vomica, in fine powder1	pou	ınd.
Alcohol60		
Distilled water20		

(As already intimated, I should recommend a somewhat weaker menstruum, consisting of alcohol 54 fl. oz., and water, 27 fl. oz.)

Mix the alcohol with the water, and moisten the nux vomica with 20 fluid ounces of the mixture. Allow this to macerate twelve hours, transfer to a percolator, and exhaust with the remainder of the menstruum, added in successive portions; press the mass, filter the expressed liquid, and add it to the percolate. Take of this liquid one fluid ounce, and estimate the amount of total alkaloid in it in the following way: Evaporate almost to dryness over a water bath, dissolve the residue in two fluid drachms of chloroform and half a fluid ounce of — Pharmaceutical Journal and Transactions, Feb. 9, 1884.

dilute sulphuric acid with an equal bulk of water, agitate, and warm gently. When the liquids have separated, draw off the chloroform and add to the acid liquid excess of solution of ammonia and half a fluid ounce of chloroform, well agitate, gently warm, and after the liquids have completely separated transfer the chloroform to a weighed dish, evaporate over a water bath, and dry for one hour at 212° F. Allow the residue of total alkaloid to cool, and then weigh. Take of the percolate as much as contains 131½ grains of total alkaloid, and evaporate over a water bath until the extract weighs two ounces.

Ten grains of this extract should yield to assay exactly 13 grains of total alkaloid.

A simple method of assaying Crude Ipecac is desired.

A. B. LYONS, M. D., OF DETROIT.

Complaint is frequently made of preparations of ipecac that they are deficient in strength. It not infrequently happens that a preparation of the drug is employed under circumstances which render it a matter of the utmost importance that it shall produce promptly its peculiar physiological effect. Failure may mean indeed death of the patient to whom the dose has been administered. It is obvious, therefore, that a ready means of ascertaining the quality of preparations of this drug ought to be in the hands of every pharmacist, and that it should be so simple that there could be no excuse offered for remaining in ignorance in regard to the character of preparations to be dispensed. The query I have accepted appears to have been prompted by some such considerations as these, and although in its letter it applies only to the crude drug, it is fair to assume that its spirit may cover an inquiry into the method of assaying the galenical preparations of ipecae.

Crude ipecac may be assayed in various ways according to the object proposed in the investigation. We may desire to know simply what is the medicinal activity of the root in its crude state, either expecting to employ it in the form of a powder to be given in substance, or desiring to know how to adjust the doses of the various preparations of the drug. Or we may wish to ascertain how much alkaloid we can extract from the root by a given process; our assay process in such a case would not seek to exhaust the drug, but rather to imitate on a small scale the extraction process adopted in the actual manufacture.

Before entering upon a study of these several assay processes, it may be advantageous to review the methods that have been proposed for extracting emetine from the drug.

The process of MM. Pelletier and Dumas (Ann. Ch. Phys. [2] xxiv, 180) is that given in most of the text books. It is quoted in Watts' Dictionary of Chemistry as follows: "The powder of ipecacuanha is digested in water with calcined magnesia; the deposit is thrown on a filter, washed carefully with very cold water and dried, and the emetine is then taken up by alcohol. It may then be combined with an acid, and the salt may be purified with animal charcoal." The yield is not stated. The method is one I have never tried, partly because I hesitated about exposing the alkaloid to the action of magnesia during the drying process, and partly because experience with other alkaloids does not favor the use of an aqueous menstruum in the primary extraction.

A process quite similar to this one in principle was recommended in 1875 by Glenard (Journ. de Pharm. et Chim. Sept. 1875) but ether is employed as the solvent in place of alcohol an obvious improvement, and lime is substituted for the mag-The process "consists in treating with ether a suitably prepared powder, or an extract of ipecacuanha and lime, or the precipitate formed upon adding an excess of lime to a solution obtained by treating ipecacuanha in the cold with water acidulated with sulphuric acid. Either of these mixtures, or the precipitate when treated with ether will yield all the alkaloid it contains." The alkaloid is removed from the ethereal solution by shaking with acidulated water, and may then be precipitated by the addition of ammonia. From this precipitate crystallizable salts may be readily prepared, although these salts require careful manipulation to obtain them in the crystalline form. Glenard observes that ammonia does not precipitate from solutions containing an excess of (hydrochloric) acid all of the alkaloid, a portion being retained in the solution, probably in the form of a double salt of emetine and ammonia.

In 1877 MM. Lefort and Wurtz published (Journal de Pharmacie) a process involving the same general principles, but taking advantage, in the first stage of the operation, of the sparing solubility of the nitrate. "An alcoholic extract of ipecacuanha is dissolved in about its own weight of water. A cold saturated solution of potassium nitrate is added, until a precipitate ceases to fall, and the mixture is set aside 24 hours. The abundant, pitchy, blackish brown deposit is washed three or four times with a small quantity of water, dissolved in a little hot alcohol, and thrown into a thick milk of lime, containing about its own weight of calcium hydrate. The mixture is evaporated to dryness on a water-bath, the mass powdered and extracted by maceration with ether."

Podwyssotzky in 1880 (Pharm. Zeitschr. fur Russl.) published an improved method for preparing pure emetine, and described anew the properties of the alkaloid. His process depends on the solubility of emetine in hot petroleum benzin. He recommends to treat the powdered drug with ether, then with petroleum benzin, to remove fatty and waxy matter, to exhaust

the powder with 85 per cent. alcohol employing a moderate heat, but without addition of acid, to evaporate the extract to the consistence of a syrup, and when cold add ferric chloride (10 to 13 per cent. of the weight of the drug) in concentrated aqueous solution; then having added an excess of sodium carbonate, to boil the mixture with several successive portions of petroleum benzin as long as alkaloid is taken up. The solution when cold deposits the alkaloid in white flakes, and the product is very pure. An alternative process is given which is much simpler. The powdered ipecacuanha is triturated to a thick paste with a little hydrochloric acid, ferric chloride added as before, then sodium carbonate and the mixture is allowed to stand some time. It is then extracted with successive portions of ether, and the alkaloid removed from the etherea solution by acidulated water. Soda is then added in excess, and the alkaloid removed by boiling petroleum benzin, as in the first process. The author states that the best kinds of ipecacuanha yield from three-quarters to one per cent. of emetine; inferior kinds only one-quarter to one-half of one per cent.

It has seemed to the writer that this last process, which is the best yet proposed, can be still further simplified and improved, and experiments appear to warrant the recommendation of a process like the following: "Mix ten parts of the powdered ipecacuanha in a flask, or other suitable container, with an equal weight of petroleum benzin. Add a mixture of two parts of stronger water of ammonia with eight parts of alcohol: shake the mixture well and allow it to stand a short time in a warm place. [In my experiments I allowed the mixture to stand from half an hour to one hour, but I am not sure that there is any advantage in leaving it so long a time even as this.] Proceed to extract the alkaloid by boiling with successive portions of petroleum benzin, amounting in all to ten or fifteen times the weight of the drug. Filter the benzin solution while hot through paper, and treat it with water containing sulphuric acid, which readily removes the whole of the alkaloid, leaving resinous matter in the benzin. Separate the acid solution, filter if necessary to remove suspended matter, add excess of alkali (carbonate of barium, carbonate of sodium, or ammonia) and take up the alkaloid with boiling petroleum benzin, as recommended by Podwyssotzky. I believe that by this method it is practicable to extract from ipecacuanha of good quality not less than two per cent. of alkaloid The solvent used, although employed in large quantity, is a very cheap one, and the loss in manufacturing operations would be a trifling item of expense, as compared with that involved in the use of the more expensive solvents, such as alcohol, ether or chloroform.

The process, moreover, is one which can easily be employed as an assay process, which is not true of any of those previously passed in review. Its advantages for this purpose are its simplicity of execution, and the rapidity with which it can be carried out. It does not completely exhaust the drug, although it permits us to extract a larger proportion of the alkaloid than any other rapid method I have tried. By using a portion of chloroform in connection with the benzin, the process may be made to yield results, as we shall see later, reasonably satisfactory. Obviously, in any case, if our object is to ascertain, not the absolute, but the practical value for the manufacturer of a given sample of ipecac, we should be justified in making use of even an imperfect method of assay, the results of which would indicate the quantity of alkaloid we might hope to obtain from the drug.

Of the methods that have heretofore been proposed for the assay of ipecacuanha, that of Zinoffsky, recommended by Dragendorff (Werthbestimmung einiger starkwirkender Droguen) is the only one worthy of consideration. Dragendorff directs to mix the finely powdered drug with five times its weight of water containing sulphuric acid [one minim of a dilute acid 1:8, for each grain of drug], allow to macerate twenty-four hours, add alcohol, equal in weight to the water used, and continue the digestion 48 hours. An aliquot portion of the fluid is then to be evaporated to drive off the spirit, and the residue diluted with water, filtered and titrated with Mayer's reagent, of which 1 cc. precipitates 0.0189 gm. emetine.

The process is very easy of execution, and has in its favor

the circumstance that it shows a larger proportion of alkaloid than any other assay process.

The time of the assay may be somewhat shortened, if the drug is employed in a very fine powder, by allowing the maceration to go on at a temperature of 50°C. (122°F.) and shaking the mixture frequently. It is not, however, easy to reduce the root to an impalpable powder, and it is better, when there is no haste, to extend the time of maceration to three or four days. The details of the process, as I am in the habit of using it, are as follows:

Place in a suitable bottle or flask 50 cc. of distilled water (without addition of acid), afterwards put in ten grams of ipecacuanha in fine powder; mix, cork the bottle or flask, and set by in a warm place, shaking occasionally. At the end of twenty-four hours add to the mixture 52 cc. of alcohol, making a total of 100 cc. of menstruum owing to condensation of volume; cork, and set aside again for three days, shaking well several times a day. Then measure out with a pipette for the assay 25 cc. of the clear fluid, which will represent as nearly as possible 21 grams of drug. Put this in a capsule, add 5 drops of a highly dilute sulphuric acid (containing 6 per cent. H₂ SO₄), evaporate at a gentle heat until all the alcohol is driven off, add water to make up to the original measure of 25 cc., digest a few minutes on the water bath, allow the mixture to cool, and proceed, without filtering, to titrate with Mayer's reagent. [Filtration appears to involve a needless expenditure of time, observation showing that it does not affect the result.

The solution employed for the titration may conveniently be made of one-half the strength of Mayer's reagent. One litre will contain therefore 6.773 grams corrosive sublimate and 25 grams potassium iodide. Add of this reagent two or three ec. at first, and filter. As soon as a sufficient quantity of clear filtrate has run through (5 to 10 cc.) add to this a few drops of the reagent, and if a copious precipitate is produced, add about 1 cc. and immediately return the mixture to the filter. The first portion of filtrate (10--15 cc.) that passes after this has been done must be returned also, but the succeeding portion is to be tested again with Mayer's reagent. As soon as the

precipitation ceases to be copious, the reagent is to be added only 0.1 cc. at a time, and nearly the whole of the fluid allowed to pass through the filter before testing again. Filtration is generally rapid, so that the entire operation consumes but a short time, and it is easy to carry on several titrations at once, where a series of assays are to be made. The time actually occupied in such an assay is scarcely more than half an hour, and the manipulations require no especial skill. The result is easily calculated, by merely multiplying the number of cc. of reagent consumed by 0.378, the product expressing the percentage of emetine in the drug. It is customary to calculate the result upon the dry drug, but for commercial purposes there is no advantage in doing this. It is easy, however, to obtain the corrected figure, if at the same time that the powder is weighed for the assay, a second portion of one gram is also weighed for estimation of moisture. This is to be dried at a temperature not exceeding 105°C. (221°F.), as long as it continues to lose weight. In this way, it will be found that the powder generally contains 5 to 8 per cent of moisture.

Suppose the drug to have contained 6.5 per cent. moisture, and to have indicated in the assay 2.4 per cent. emetine. The corrected per cent. will be found by solving the proportion 100—6.5:100:: 2.4: x, and will be, therefore, 2. 4 divided by .935=2.57 per cent.

To what extent, however, can we put confidence in these results? We find, in most cases, that results obtained by titration with Mayer's reagent vary very greatly according to the dilution of the fluid. It is therefore necessary, in order to obtain results of any value, to be careful that the proportion of alkaloid contained in the solution shall not vary materially from a fixed standard, and it is equally necessary to employ always in the assay the same proportion of free acid. It is, indeed, often necessary to make two titrations, the first merely to ascertain approximately the amount of alkaloid present in order to determine what should be the volume of the fluid to be titrated, and a third experiment even may become necessary. Emetine is, however, an exception to the majority of alkaloids in this regard. While dilution of the fluid is not

without influence on the result, this influence may be disregarded if the proportion of alkaloid in the fluid lies between 1:250 and 1:500, and such is almost invariably the case if the directions above given be followed.

The examination of the various galenical preparations of ipecac can also be readily made by Mayer's reagent. Solid extracts are to be exhausted, with acidulated water, or, in case they contain much resinous matter, with acidulated alcohol, water being afterwards added and the spirit evaporated off; the aqueous fluid is to be then titrated as usual. The fluid extract presents no difficulty whatever. Dilute a portion of the fluid with water to exactly four times its original volume, and take 10 cc. of the mixture for the assay. Add 5 minims of the 6 per cent. sulphuric acid, evaporate on the water bath to drive off alcohol, make up to a volume of 15 cc., and titrate.

A more important question, however, arises, viz: does the drug contain nothing besides emetine capable of giving a precipitate with Mayer's reagent? The results of assay by the method of Dragendorff indicate the presence in ipecac root of from 2 to 3.9 per cent, of emetine. Those who have attempted to extract the alkaloid have generally reported a yield of less than one per cent., but this, as I have already intimated, is due in part, at least, to defective methods of extraction. Dragendorff, himself, admits that he was not able to extract, by means of chloroform, the entire amount of emetine shown to be present by titration with Mayer's reagent. This he attributes to loss of alkaloid through the action of the alkali employed to set it free, although in some of his experiments he used for this purpose barium carbonate, and it seems hardly possible that this should exert such an influence. By the use of Mayer's reagent he found in the drug about 3.75 per cent. of He was able, however, to extract by chloroform only 2.4 to 2.9 per cent., but he does not say distinctly that the same drug was employed in both cases. Others have had a similar experience. One observer only has reported identical results by the two processes, and he states that he took the precaution in the extraction with chloroform to exclude air from the flask My own results, in a series of experiments with one sample of ipecac, seem to me to confirm Dragendorff's view, but in experimenting with another sample of the drug the discrepancy in results seemed to me greater than could possibly be accounted for by changes taking place in the alkaloid during the very short process of extraction. That the alkaloid is an extremely sensitive one no one who has experimented with it at all can doubt. Even after it has been isolated, it must be kept in the dark to prevent changes that would otherwise take place in it.

Incidentally, I may ask, in view of this sensitiveness of the alkaloid, what shall we think of the present U. S. P. process for making fluid extract of ipecac, with its complicated manipulation and long exposure of the product to heat?

There is no difficulty in preparing a fluid extract of ipecace with alcohol of moderate strength that will contain, by Dragendorff's mode of assay, upwards of 2 per cent. of emetine. By the U. S. P. process, a drug which assays 3 per cent. alkaloid will produce a fluid containing less than 1.5 per cent. From the first mentioned extract, similar to that which was formerly official, it is easy enough to prepare a syrup, although certainly this cannot be done by simply mixing the fluid extract with syrup; to my own mind the admission of the present formula into the U. S. P. is an unwarranted concession to slipshod pharmacy, against which we should all unite in protest.

Returning from this digression, I attack the main problem of this "query," seeking some simple method of actual assay by which the whole of the emetine may be extracted from the drug in a weighable form.

An exhaustive study of this problem would require much more time than I have been able to give it. I have made many experiments, a large number of them having no value except as indicating plans to be avoided in future. The principle to be adopted in every case in the assay of a drug of this kind, is to select such a menstruum for the exhaustion of the drug as shall extract as completely as possible its active principle and withdraw with it a minimum of inert matter. The solvent which I

have found most generally useful in these assays is that employed by Prollius for extracting the alkaloids of einchona bark. It consists of a mixture of ether 250 parts, absolute alcohol 20 parts, ammonia, stronger, 10 parts. The general mode of carrying out the assay I have elsewhere described in detail. ("Druggist's Circular," August, 1884.) As applied to the assay of ipecac it would be conducted as follows:

Place in a small flask (capacity about 50 cc.) 21 grams, accurately weighed, of ipecac in fine powder; select a sound cork to fit the flask, and weigh flask and cork with the contained ipecac. Fill the flask nearly full with the mixture of ether, ammonia, and alcohol, and set aside, shaking occasionally, for twenty-four hours. Weigh the flask with its contents before removing the cork; decant as much of the clear fluid as practicable, taking care to operate rapidly to avoid evaporation. Immediately cork the flask again and weigh. You may now separate the alkaloid from the decanted portion of ether by shaking repeatedly with acid water, and again washing out from the aqueous solution, rendered alkaline, with chloroform, but identical results can be obtained more rapidly by merely evaporating the ether after addition of water containing 10 minims of 6 per cent. sulphuric acid, and titrating the aqueous solution (made up to 20 cc.) with Mayer's reagent.

The calculation of the assay is not difficult. You have as data total weight of solvent used, weight of portion of solvent with contained alkaloid, resins, etc. You may assume that the solvent has taken up in all 5 per cent. of material from the ipecac. This will amount to $2.5 \times .05 = 0.125$, to be added to the weight of the total solvent—a quantity so trifling that it may be neglected in practice—since this assay is not close enough to render important minute fractions.

Suppose the weight of the solvent to have been 40 grams, the portion decanted 26 grams, and the alkaloid obtained from this decanted fluid to have been 0.055 grams (=5.82 cc. of Mayer's reagent). Then, 26:40::.055:x, x being the quantity of alkaloid contained in the 2.5 grams of drug used. Solving the proportion, 40×.055, divided by 26=.0846. Since the quantity of drug used was 2.5 grams, this result multiplied by 4, with the

decimal points removed one place toward the right, will give the per cent. (approximately) of alkaloid in the drug, in the above example, 3.384 per cent.

The results I have obtained by this method of assay have, however, been unsatisfactorily low, and, until some of the details are a little more fully worked out, I regard it only as a plan promising well. I have substituted for the ether in this process petroleum benzin, and mixtures of chloroform and ether, the results in the former instance wholly disappointing, and in the latter not as satisfactory as where ether alone was used.

I believe that when experiment shall have determined what quantity of solvent is required, how much ammonia should be used, and how long the maceration should continue, the process will prove a good one, and it has this advantage over Dragendorff's process, that it is not liable to give results above the truth. In experiments recently made, I obtained from the same ipecac, by Dragendorff's method, 2.64 per cent. emetine, by the same, modified as I have described in detail 2.72 per cent., by the ammoniated ether process 2.42 per cent.; by the same using a mixture of ether and chloroform 2.3, and in a second experiment 2.18 per cent.; ammonia and benzin extracted after 48 hours maceration only 1.12 per cent., and even when the maceration was carried on in a warm place, the yield was only 1.32 per cent. Ammonia and boiling benzin, the process suggested for the manufacture of emetine, extracted 1.8 per cent. to 2 per cent.

Experiments made with chloroform as a solvent have given the best results yet obtained. One plan, which is both simple and rapid, is the following:

Place in a flask 5 grams of finely powdered ipecac, add a mixture of strong ammonia 1 gram, alcohol 5 grams, chloroform 30 grams. Set in a warm place half an hour, then apply sufficient heat to keep the mixture boiling for one hour; then add 50 cc. petroleum benzin, boil half an hour, add benzin enough to make the mixture measure nearly 100 cc., filter, and add through the filter enough benzin to make 100 cc. Of this take for the assay 25 cc., and treat as in the ammoniated ether process.

From the same ipecae as that used in the former experiments, I obtained in this way 2.6 per cent. alkaloid.

Still another experiment has given encouraging results. By using the menstruum which Messrs. Dunstan and Short have found the most suitable for exhausting nux vomica, I found that ipecac could be easily and quickly exhausted. This menstruum consists of a mixture of three volumes of chloroform, with one of alcohol. The ipecac, 5 grams, can be placed in an extraction apparatus, and treated by hot repercolation with about 40 cc. of the mixture. The alkaloid can be removed from the chloroform by washing repeatedly with acid water, and the acid fluid can then be titrated, or the alkaloid can be removed from it by rendering it alkaline and shaking repeatedly with chloroform, dried and weighed. The method is well adapted for exact assays, and in the analytical laboratory will doubtless be preferred to any other.

For the pharmaceutical chemist the treatment with chloroform and benzin is to be recommended, being very simple, rapid, and practical, provided further experience shall demonstrate its complete trustworthiness. With regard to both of these last described processes, although I feel confident that they more nearly satisfy the requirements of the problem in hand than any that have heretofore been proposed, I have not had the time to elaborate their details sufficiently to warrant me in declaring the problem completely solved. I trust that this contribution to the discussion of the subject will be of some service in directing future effort towards its final solution.

The practical result of my experiment has had, at any rate, this outcome, that it has given me increased confidence in the method of Dragendorff, which I have heretofore regarded with a certain amount of distrust.

In concluding this paper, I have thought it might be of interest to give a summary of some of the results of the assays I have had occasion to make of ipecae, and of its preparations, premising that their results have been obtained by the use of Dragendorff's method of assay, when not otherwise stated.

Of 48 samples of crude drug examined, 5 contained less than 2 per cent. emetine (minimum 1.65 per cent.), 10 contained between 2 and 2.5 per cent., 23 between 2.5 per cent. and 3 per

cent., and 10 upward of 3 per cent. The following items of description are noted in connection with some of the samples:

	Per cent.
Thin roots, nearly black	2.2
Flesh colored "bold" sample	. 2.95
Flesh colored, good appearance	
Thin, dark root	. 1.65
"Bold" sample (white)	. 2.25
u u	. 2.75
Pale flesh color	. 3.00
White, bold, tender roots	. 2.7
" ' " woody	
Dark colored, much broken	

Solid extract of ipecac has ranged in content of alkaloid from 8.9 to 10.3 per cent. Powdered extract, from 6 to 7.5 per cent. Fluid extracts made by the U. S. P. process contain generally less than 1.5 per cent. Made by processes that do not involve the use of heat, the percentage is higher, but does not generally exceed 2 to 2.25, and often falls short of this. The samples examined have been those of a number of manufacturing firms, and many of them are regarded as articles of excellent quality.

The time must very soon come when the alkaloidal strength of galenical preparations of all active drugs will be regulated by our official standards. It rests largely with associations like this one to cultivate the analytical investigations which will result first in fixing such authoritative standards, and then in securing such an education of the retail druggist as shall enable him to save the law from becoming a dead letter.

The specific gravity tables of the U.S. Pharmacopoeia, (supplemental report.)

A. B. LYONS, M. D., DETROIT.

There is little to be added to the report submitted last year. There was opportunity after presenting that report, before the results were called for for publication to complete most of the necessary work on the tables, which therefore require now no additions or emendations, except in a few minor points, which I present herewith as corrigenda.

A further study of the tables for potash and soda convinces me that the tables of Gerlach, on which those of the U. S. P. are based are practically correct, when solutions of the pure alkalies are used. In practice we seldom meet with solutions sufficiently pure to permit of any exact estimation of strength by specific gravity. Hence tables such as those given in the U. S. Pharmacopæia are sufficiently full, but if inserted at all, it should be with a note calling attention to the fallacious character of the indications afforded by specific gravity, and recommending that the strength of alkaline solutions be determined in all cases where any accuracy is demanded, by the use of

volumetric acid. Since my report was submitted, I have met with Mendelejeff's alcohol table, which is said to be the result of exceedingly careful observations, and should certainly be taken into consideration in constructing any new table. Reduced to a basis for comparison with the other tables previously given, Mendelejeff's figures are as follows: (Temperature of observation 60° F., unit of comparison, water at the same temperature; apparent specific gravities by pycnometer weighings made in air.)

Per cent. by weight abs. alcohol.	Specific gravity.	Averages.
9	•	1.00000
	00404	
10		
15		
20	97148	
25	96505	
30		
35	94895	
40	93942	
45	92912	
50	91830	
55	90709	
6 0		
65	88402	
70	87220	
75	86026	
80	84809	
85	83557	
90	82258	
95	80870	
100	79372	79376

The last column gives general averages from observations of Fownes, Gilpin, Mendelejeff, Squibb and myself, but Squibb's results in this average are reduced to a basis of an absolute alcohol having a specific gravity of .79375, as are those of Gilpin. If Dr. Squibb's observation of the specific gravity of absolute alcohol is to be accepted—and I see no reason to question his conclusions—the final results reached in my former study of this subject are substantially accurate. Apart from the question what is the true specific gravity of a strictly anhydrous alcohol, it is safe to say that the figures of Mendelejeff are a much closer approximation to the truth than those of

Fownes which form the basis of the present U. S. P. table. They are also in very close agreement with the incomplete results of Gilpin, and with those of Dr. Squibb, and by combining these three we shall come as near to absolute exactness as we can ever hope to do. The results of Gilpin seem not to be reduced to true specific gravities (in vacuo) but this we only infer; were we certain on this point, we should feel still greater confidence in the final result. As I have just said this result is practically in accord with the tables already presented, which find confirmation of their correctness in the figures of Mendelejeff.

After using in daily practice for a year the condensed specific gravity table for acids and ammonia, I may say that I have detected but one important error in its figures, viz: in those which relate to hydrochloric acid of from 32 to 40 per cent. For these I offer among the "corrigenda," the correct figures.

Corrigenda in tables published in the "proceedings" for 1884:

Page 178. For "per cent (vol.) absolute alcohol," in the headings of columns 1, 3, 5, 7 and 9, read "per cent. by weight," &c. The headings of the other columns should then read "corresponding per cent., by volume."

On page 179 the figures in the 4th, 5th, 6th and 7th columns, from 32 to 40 per cent., inclusive, should read as follows:

506	6067	6050
500	6566	6549
493	7059	7041
488	7547	7529
483	8029	8010
479	8507	8488
473	8979	8959
465	9444	9424
455	9899	9878
	500 493 488 483 479 473 465	500 6566 493 7059 488 7547 483 8029 479 8507 473 8979 465 9444

On the same page, 5th and 6th columns, 23d line from bottom, for 1.0380 and 1.0369, read .10380 and .10369.

On page 181, in the 6th column, 21st line from bottom, for 99 read 89.

On page 183, 5th column, 1st line, for .1331 read .4331.

On page 190, the figures for hydrochloric acid, from 32 to 41 per cent. inclusive, should read as follows:

6165	.0198	.075
6665	.0200	.078
7158	.0203	.081
7646	.0205	.082
8129	.0207	.083
8607	.0209	.085
9080	.0211	.089
9545	.0215	.092
.20000	.0219	.097
0445	0222	.101

On page 191, the figures for sp. g. of acetic acid 29%, should be 410 instead of 400.

On page 192, sp. g. of nitric acid, 81% for 621 read 631, and of acid of 82%, for 655 read 665.

On page 198, 4th column, last line, for 81.06 read 82.06.

On page 200, 1st column, 5th line from bottom, for 37.2 read 57.2; column 4, 12th line from bottom, the figures are 470, and 10th line from bottom 412; 7th column, 2d line from bottom, the figures are .999915; on page 201, 6th column, 7th line from bottom, for 844 read 5844.

A number of the figures in the last table are illegible, and should be distinctly written in as follows:

Page 200, column I. line 3, 33.8; line 6, 35.6; line 19, 44.6; line 22, 46.4; line 32, 53.6; line 41, 60.

Column II. line 26, 9.44; line 30, 11.66; line 39, 14.44; line 42, 16.

Column III. line 1, .999875; line 4, 9937; line 15, 980; line 17, 965; line 18, 945; line 36, 381; line 41, 070; line 42, 001.

Column IV. line 32, .426; line 37, .209.

Column V. line 4, .496; line 30, .455; line 31, .409, line 33, .365. Column VII. line 13, 844; line 14, 999915.

Column IX. line 5, .595; line 21, .585; line 23, .575; line 36, .455; line 40, .397.

Page 201, column I. line 30, 81; line 31, 82; line 34, 84; line 35, 84.2; line 38, 87; line 39, 87.8; line 14, 89; line 42, 89.6; line 43, 90.

Column II. line 2, 16.66; line 7, 18.33; line 35, 29; line 36, 29.44; line 37, 30.

Column IV. line 24, .076; line 29, .553; line 31, .352. Column V. line 17, .908.

Column VI. line 2, 8923.

Column VII. line 5, 545.

Column VII. line 22, 374.

Column IX. line 2, .328; line 7, .258.

The figures in the last column of the table on pages 200 and 201 are stated to have been "based upon the ratio of gramme to grain, and meter to inch," and were substituted for others in which the commonly accepted value of the cubic inch of water at standard temperature and pressure was adopted. substitution was ill advised, although made as the result of a communication from the U.S. Bureau of weights and measures, in which I was informed that there was no discrepancy of consequence between the theoretical and the actual gramme. Subsequent research has brought to my knowledge the fact that there is an alleged discrepancy, amounting in fact to about five parts in 10.000, and that the observations upon which the commonly accepted statements are based were made with exceeding care, and are in every way worthy of confidence. Barnard, in his "Metric System," gives the original data for the computation, from which he himself deduces as the weight of a cu. in. of water at 62°, and in air at same temperature, barometer at 30 in. and air of ordinary humidity, 252.48843 grains.* Capt. Kater made it 252.456 grains. I have carefully gone over the calculations and find that Capt. Kater's results were not far from the truth. My own result was 252.45533 grains, corresponding with a weight, at maximum density, in vacuo of 253.007 grains, or very nearly that.

(If we adopt Kopp's statement of the expansion of water, the weight of the cu. in. of water at maximum density deduced from Schuckburg's observations will be almost exactly 253 grains.)

The figures in the last column of the table are therefore all too low. They will be nearly correct if to each is added the constant 0.127 and the weight in vacuo will be obtained approximately by adding to this sum 0.272.

^{—-*}An error has been detected in Prof. Barnard's computation of much greater magnitude than those he exposes in Capt. Kater's work.

The first correction would of course be more exactly made by multiplying the figures given by the factor 1.000503, and the second by multiplying the corrected figures by 1.001077.

In the tables on pages 198 and 199, the Hassler gallon was adopted in place of that of the U. S. P. The difference is small, amounting to less than ten grains, but there is no question that by a gallon we are to understand 231 cu. in. and that the weight of a gallon of water at 59° F. will therefore be, not 58,324.8 grains, assumed in the table, but 58,333.55 grains. The figures given in the table are, however, correct for a temperature of about 60.5° F. and the difference is therefore scarcely beyond the range of the ordinary errors of observation with common thermometers, and the appliances used for weighing in ordinary manufacturing operations.

Experimental determinations of the coefficients of expansion by heat of officinal liquids, particularly of solutions, dilute acids, &c.

A. B. LYONS, M. D., OF DETROIT.

All who have occasion frequently to estimate the purity or strength of liquids by their specific gravity, will appreciate the importance of having authoritative statements not only of the normal specific gravity of the liquid under consideration at a stated temperature, but also of the influence on the specific gravity of variations in temperature within a range of 10° or 15° above or below that temperature. The standard temperature generally adopted, 59° to 60°, is a very inconvenient one, in this climate, or in any other with which I am acquainted.

Even in winter, we keep the temperature of our working rooms many degrees higher than this standard, and in summer it is impossible, without the aid of ice or refrigerating mixtures to reduce the temperature of the liquid to standard. To secure any exact temperature in a liquid requires considerable time, and time is precious. After bringing the temperature of our liquid to the standard, we must make haste to weigh it before it begins to escape by its expansion, in removing it to the warm atmosphere of the weighing room, and in summer we often find it impossible to secure a trustworthy weighing, owing to condensation of aqueous vapor on the pycnometer—unless the air in the balance-case is artificially dried.

If we have, however, a reasonably accurate statement of the proper correction to be made if the temperature is above (or below) the standard, we have merely to observe the temperature of the fluid, take its apparent specific gravity by the pycnometer or hydrometer, and apply the correction.

I am strongly inclined to the adoption for ordinary use of a standard temperature much higher than that now employed, and at the suggestion of Prof. Oldberg, of Chicago, I have recently prepared for publication a set of tables in which the standard is 22.° C. (71.6°F.), the standard of comparison being water at the same temperature. The apparatus generally employed, however, assumes that the old standards are to be used, and it will be difficult to effect a change where usage is so fixed and all the text-books give specific gravities on the basis of those standards.

Few of the text-books attempt to state the corrections to be applied in case observations are made at temperatures other than the standard. In the few instances in which corrections are given, the figures are so wide of the truth that they are little better than none. Thus, in Hoffman & Powers's excellent book on the examination of medical chemicals, we find appended to some of the specific gravity tables directions for making approximate temperature corrections, of which the following is a sample:

"The specific gravity of the aqueous acid (hydrochloric) being decreased by an increase of temperature, and increased by

a decrease of temperature, the consequent change of the specific gravity amounts for each degree of the centigrade thermometer in either direction:

```
For acids of a sp. gr. of 1.17418 to those of 1.1389 to about 0.0005
" " " " " " " 1.1349 " " " 1.0980 " 0.0004
" " " 1.0687 " 0.0008
```

For instance: An acid of a sp. gr. of 1.1234 at 16° C. containing 25% of HCl., will have at 18.5° C. a specific gravity of 1.1234— $(0.0004\times2.5)=1.12241$, and at 13.5° a sp. gr. of 1.1234 + $(0.0004\times2.5)=1.1244$."

The data here furnished are curiously incomplete. We have no correction given for an acid having a higher sp. gr. than 1.1741, although the table runs on to an acid of sp. gr. 1.2000, and no correction is given for acid of a lower density than 1.0637, containing 13% of HCl. On the other hand exactly the same correction is to be made for acid containing 28.136% as for that containing 35.068%; where the proportion is 27.321 a different correction is to be made, but what if the strength should be intermediate between 27.321 and 28.136%? It would seem more natural to select the strength of acid requiring a correction of exactly 0.0004, &c., and leave intermediate values to be interpolated.

But do the figures given approximate even remotely the corrections which, in fact, should be applied? We are compelled to say they do not. I have brought together from different parts of the work the data given for corrections of this kind, and give, in a supplemental column, the true corrections (averages) according to personal observation and the statements of eminent physicists:

	HYDROCHLORIC ACID.	
Specific Gravity.	Corrections According to H. & P.	True Corrections.
1.1741 to 1.1389	0.0005	0.00066
1.1349 " 1.0980	.0004	.00051
1.0939 " 1.0637	.0003	.0003 8
	NITRIC ACID.	
Sp. Gr.	Corrections for 1° C.; H. & P.	True Corrections.
1.494 to 1.477	0.00213	0.00174
1.474 " 1 456	0.00200	0.00163
1.456 " 1.435	0.00186	0.00153
1.429 " 1.410	0.00171	0.00138
1.405 " 1.381	0.001 5 5	0.00130
1.374 " 1.358	0.00141	0.00124
1.346 " 1.317	. 0.00128	0.00119
1.304 " 1.274	0 00114	0 00112
1.274 " 1.237	0 00100	0.00108
1.237 " 1.198	0.00085	0.00104
1.192 " 1.166	0.00071	0.00095
1.157 " 1 120	0.00050	0,00088
	PHOSPHORIC ACID.	
Specific Gravity.	Corrections for 1° C.; H. & P	. True Corrections
1.0567 to 1.1196	0.00035	0.00027
1.1262 " 1.1889	0.00040	0.00036
1,1962 " 1.2651	0,00052	0.00043
1.2731 " 1 3486	0.00068	0.00052
1.3573 " 1.4395	0.00082	0.00058
	SULPHURIC ACID.	
8p. Gr.	Corrections for 1° C.; H. & P.	True Corrections.
1842 to 1.786	0.00140	0.00108
1.777 " 1.662	0.00120	0.00105
1.651 " 1.306	0.00100	0.00079
1 297 " 1.215	0.00075	0.00067
1.206 " 1.144	0.00045*	0.00059
1.136 " 1.068	0.00047	0.00045
	ETHER.	m a
8p. Gr.	Corrections for 1° C.; H. & P.	True Corrections (Squibb.)
.7198 to .7331	.00130	.00106
7342 " .7504	.00110	.00101
.7516 " .7627	.00090	.00097
.7640 " .7764	.00080	(00094)
H 1 1 1	2' - 4 - 1 4 3	43

For alcohol we are directed to make a correction on the percentage of 0.4 for every degree centigrade, above or below the —*An obvious misprint for 0.00065.



standard temperature. This correction is sufficiently near the truth in the case of alcohol of from 25 to 70 % (vol.), but is too large for spirit either stronger or weaker than this. A better approximate statement would be, "For strong alcohol make a correction of 0.25 % on the indications of the alcoholometer for every degree centigrade above or below the standard temperature. For a spirit of 85 % the correction is 0.3 % for each degree; for a spirit of 60 to 70 % correction 0.36 %; for a spirit of 30 to 40 %, correction 0.45; for a 25 % spirit, correction 0.36; for a 20 % spirit, 0.28; for a 1 % spirit, correction 0.12." But so full a statement as this cannot well be carried in the head.

The alcoholometers which are commonly used in this country, when furnished with a thermometer and scale of corrections are most ingeniously constructed to mislead and mystify the guileless revenue officer. Here is a copy of the scale of corrections which forms a part of the See Fig. 1.

The only meaning I can make of this scale is, that for spirits of 25° to 100° above proof, a correction of one degree for every 34° F. is to be made on the reading of the instrument. For spirit of 10° below to 25° above proof the correction is to be one degree for every 3 degrees F. For spirits of 100° to 10° below proof, a correction of one for every 21° F., the correction to be in every case additive if the temperature is below standard, and subtractive if it is above standard. Of course, for degrees below proof, the corrections should in fact be added if the temperature is above and subtracted if below standard. Otherwise the corrections may be criticised as in general too small, except for strong alcohol, but too large for spirit between 60° and 100° below proof. From proof to 50 below proof, it would be fair enough to state the correction as one degree for every 2' or 21° Fahr., but for spirit weaker than 60° below proof, the correction diminishes very rapidly, particularly for temperatures above standard.

It was because, among the meager statements of the authorities in regard to temperature corrections, there were so many inconsistencies and inaccuracies, that I turned my attention first to a personal study of the subject.

The data I have brought together in this paper have many of them been gathered by personal observation, although I have ransacked all accessible literature for additional material. Some of my own results I have obtained by the use of the pycnometer, taking the specific gravity (apparent) of the same liquid at several different temperatures, each accurately noted by the aid of a corrected thermometer. A large number of the observations were made with the dilatometer, a flask like an ordinary pycnometer, with the stopper extended into a graduated tube. [See Fig. 2.] The instrument I had constructed had a capacity for water at 59° F. when filled to the 0° mark of 49.587 grams. The tube had a capacity, between 0° and 100° of the scale of .158 of water. The glass was assumed to have



Fig. 2.

a co-efficient of expansion of .000026 for 1° C. Each degree of the scale corresponded with an apparent expansion of .0000319 of the total volume of fluid (a trifle less than this, of course, if the bottle was filled above the 0° mark.) In each instance two or three experiments at least were made, and the mean of (concordant) results was recorded. pansion was observed in most instances for temperatures ranging between 18° C. (64.4° F.) and 25° C. (=77° F.), since corrections generally require to be made through about this For lower temperarange of temperature. tures the expansion is always less, and for higher more, but in most cases the difference is of no importance in a range of 15 degrees C. (27 degrees F.) The tables accompanying give true and apparent co-efficients of expansion, and differences in specific gravity, true and apparent, corresponding. Since the centigrade thermometer is not yet in general use in this country, I have given results both for Fahrenheit and centigrade degrees.

In a few instances I have noted the importance of the co-efficient of expansion as indicating purity or impurity of a given product. Amyl nitrite is an instance of this. This ether is liable to contain much fusel oil, and a tedious process of distillation is necessary to ascertain how large a proportion of the ether is present. The co-efficient of expansion, however, of fusel oil is very much lower than that of the nitrite, and an approximate estimate of the proportion of the latter may be easily arrived at by noting the density at two different temperatures and thus learning the coefficients of expansion of the mixture.

In the case of acetic ether, spiritus etheris nitrosi, &c., where the specific gravity alone is apt to be misleading, or to afford no information by itself, when taken in connection with co-efficients of expansion it may lead to a correct conclusion in regard to the approximate composition of the mixture under examination.

With these brief hints, I submit the tabulated results of my work, which I trust may have a value somewhat commensurate with the labor they have cost.

TABLES OF SPECIFIC WEIGHTS AND CO-EFFICIENTS OF EXPANSION.

	Authority.	Sp. gr. at 15.0. (== 59.0 F.)	Difference in Sgr. apparent (==CORRECTION)	Difference in Sp. gr. apparent	Difference in sp. gr. true.	rence in sp. gr. true.	Co-efficient of expansion.	ient of sion. ie.	Expansion Apparent in Glass	is Glass.
		E 8	F or 1.ºC For 1.ºF. For 1.ºC. For 1.ºF.	For 1. º F.	For 1. °C.	For 1.°F.	r° C.	ı°F.	For 1°C. For 17F	For 17F.
Acid Hydrobromic Conc	Squibb.	1.2831	.000280	.000155	.000313	.000173	000245	.000136	912000.	.000122
Acid Lactic	Lyons.	1.0098	24 5 20 20	138	275 823	153	853 853	143	232	6 6 7 8
Acid Olcic, commercial	Squibb.	9		347	84.0	9	216	86		382
Acid Oleic, pure		86.5 86.5 97.5		372	933	385	173	45.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00		415
Alcohol Amylic		8141		24	787	437	8	533		516
Alcohol Ethylic	Souith	25.		3 :	888	20,	0 0 0 1 0 1	86		8,4
	. 8	7939		<u>₹</u> 4	5 0 0	<u> </u>	31	y 20		0.00 22 22 23
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		7942		468	862	479	1086	.	_	8
Alcohol Methylic	Kopp.	(2)1208.	_	529	2	530	911	199		24
Amyl Nitrite	ċ	2.8 2.8	1030	47.2	1051		1203	1 3		929 649
" impure		.8484		456	***	468	993	551		537
Benzin (Petr'l'm)	Kopp.	6789 0789		\$ 5	80 80 44 80	457	1220	673		8
Bromine.		2.085	•	1781	3283	1824	8 1	9119		
Carbon bisulph.		1.271		828	1524	847	1200	667	_	52,
Chloroform		1 4946		1005	1848	1027	1240	88	_	674
	Lyons.		8	0001	1839	1020	1226	929	٠.	9
			-			-				

Table of Specific Weights, Etc. - Continued.

	Authority.	Sp Fr. at 15.°C. (≡ 59°F.	Differ gr. (≕co	ence in Sp. apparent RRECTION.)	Difference in sp gr. true.	ce in sp. rue.	Co-efficient ex an-to-u frue,	nent of	E parson Apparent in Glass	15	ý
		ER	For 1. °C.	For 1.°F.	For 1.ºC. For 1.ºF. For 1.ºC. For 1.ºF	For 1.°F.	1.°C.	1.ºF.	For 1°C. For	For 1°!	<u></u> .
Ether, Anhydrous.	Squibb.	.7180	1116	920		630	1579				ğ
" commercial	I.yous.	.7462	10%	605	80	616	1486	825	1460		811
Ethyl Acetate	Kopp.		1193	99		674	1340		_	-	33
,, (com.)	Squibb,	0268.	1224	8		693	1394		_	-	8
Ethyl benzoate	Kopp.	1.0556	6+6	\$28		245	930				6
Ethyl bromide.	Lyons.	1.4390	20 00 00 00 00 00 00 00 00 00 00 00 00 0	81		1300	1401		_	-	ğ
Fusel Oil.	3	.8781	8	448		4 6	946			_ •	2
Liq. Ferrichlor	:	1.4024	5.40	8		320	411				14
Liq. plumbi subacet	=	1 1740	328	182		700	305				55
I iq. Potassæ,	=	1.0472	270	150		165.	285				4
Liq. Soda	:	1.0570	331	8		1661	339				7
Mercury	Kopp.	13.558	2008	1165	``.	1355	<u>~</u>				8
Methyl Salicylat	:	81.1	984	547	_	504	8		_	Ĭ	3
Oil Almonds, bit	:	1.05	949	528		542	930				S
,, ', sweet	Lyons.	.9194	999	370		383	750			•	20
Oil Anise	:	9816	879	360		374	707				65
" Black Shark	:	9216.	4	358	_	371	730		_		16
" Cod Liver	=	.9270	929	348		361	701		_		75
" Cubeb	:	.9280	723	102		415	Š		_		33
" Eucalyptus Amyg	:	.8704	792	4		452	937				8

Table of Specific Weights, Etc.—Continued.

	Authority	S : S : S : S : S : S : S : S : S : S :	Difference in Sp. gr. apparent (= cornection.	apparent RESCTION.)	Difference in sp gr. true.	ce in sp. rue.	Co-efficient expension True.	cient of nsion. ue.	Exp Apparei	Expansion Apparent in Glass.
		1.0000	Por 1. °C.	Por 1. °C. For 1. °F.	For 1. °C. For 1. °F.	For 1 F.	ູ່ເ	1.0F.	For 1°C	For 1 C. For 1 F
Oil Eucalyptus Globulus	Lyons.	0126.	792			453				
" Mustard (css)	Kopp.	610.1	1075	298	1102	612	20.	8	1054	286
Myrcia	Lyons.	0.980	812			\$				_
Olive.	= :	0.910	92			375				
Crange	. :	.x500	732			419				_
Fennyroyal	: :	272	955			377		_		
" Petrolina	: :	.8571	8			8				
Sassatrag.	: ;	1.0034	1020		_	285				
Turpentine	: :	.8790	8			412				
Wintergreen	: :	1.1870	9 <mark>6</mark>			553				
Paraldehyd	:	.9958	0101		_	574	_		_	
Phenol.	Kopp.	1.065	750			432				
Spt. frument	Lyons.	ġ	733			419				
Spt. vini gall	: :	.932	713			<u>\$</u>				_
Syrup	: :	1.330	<u>\$</u>			ġ,				
Vinum alb. &rub	:	8	224			139				

ALCOHOL.—(Per cent. by Volume.)

8 % S 4 %		o 2 2 2 4 4 8 8 4 4 8 8 8 8 8 8 8 8 8 8 8
apparent in	For 1. º F.	8 85 = 45 4 2 4 8 8 4 4 4 4 8 8 8 8 8 8 8 8 8 8 8
Expansion apparent glass.	For 1. º C.	60. 60. 60. 60. 60. 60. 60. 60. 60. 60.
Co-efficient of expansion true.	1.º F.	0 5 = 2 75 25 25 25 4 4 4 4 5 7 2 2 2 2 2 2
Co-efficient of true.	:، زر	8 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
in sp. gr.	For 1 º F.	6 5 = 2 4 5 4 4 2 4 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Difference in sp. gr. true.	For 1. 4 C.	0. 0.8 2 2 2 2 4 4 2 2 5 5 4 7 5 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
sp. gr. ap- n glass. cri n)	For 1.º F.	85 = 25 48 88884 444444444
Difference in sp. gr. parent in glass.	For 1.º C.	2 17 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Specific gravity at 15.% ((= 60.° F.) water at same	et.ooo.	1.0000 9999 9989 19861 1987 1989 1989 1989 1989 1989 1989 198
Sent.		o ~ 5 7 8 8 8 8 8 4 4 8 8 8 8 8 8 8 8 8 8 8 8

ALCOHOL.—(Per cent. by Weight.)

cent, by	Per v	0	'n	2	15	20	22	౭	33	\$	45	೭	55	8	જ	ደ	75	2	85	8	8	8
p arent in	For 1.º F.	60000	0	12	91	21	. 27	33	37	42	4	9	₫	\$	51	2 5	53	54	\$6	\$6	57	85 85
Expansion :	For 1.º C. For 1.º F	91000.	<u>∞</u>	22	28	37	64	55	8	75	79	82	8	\$	16	93	95	જ	00100	102	103	₫
f expansion	1.0 F.	01000°.	=	13	17	22	28	34	œ	53	45	47	\$	SI	22	S3	42	26	57	85	59	55
Co-efficient of expansion Expansion apparent in glass.	၁ •	881000	205	241	311	398	515	919	685	773	815	648	88	910	936	959	2	.001003	9201	1042	1059	1063
6 B 5p. gr.	For 1.º F.	01000.	=	13	17	21	27	33	37	0	4	43	\$	45	9	9	47	47	%	ঞ	84	47
Difference in sp. gr. true.	For 1. ° C.	61000.	8	57	31	38	05	59	67	7.3	92	78	2	82	83	×	∞ ∞	85	8	38	8	ळ
sp. gr. ap- n glass. crion)	For 1.º F.	060000	8	911	152	661	261	313	357	360	407	02	431	4	4	452	456	94	464	404	494	457
Difference in sp. gr. apparent in glass.	For 1.º C.	291000	177	212	280	362	473	266	643	202	733	756	922	262	805	814	821	828	835	835	835	823
Specific gravity at 15.6° C. (=60.9 F.) water at same	= 1.0000.	0000.1	.9913	.9839	9226	5176.	.9650	.9576	9490	.9394	9890	1816.	6906	.8956	.8839	81/8	8299	77.78	.8352	.8222	808.	. 7935
eight.	noq w	٥	~	0	15	8	25	ణ	35	\$	45	S	55	8	2	ደ	72	2	8	8	8	8

MIXTURES OF GLYCERIN AND WATER.

cent. of ycerin.	Per (D	•	2	2	15	8	25	ဇ္တ	35	\$	4 5	S	55	8	Ջ	2	72	8	85	8	8	8
apparent lass.	for 1. ° F.	60000	0	=	12	14	9	82	21	23	23	7	77	25	25	5 0	97	27	22	28	82	5
Expansion apparent in glass.	for 1.º C.	91000.	17	61	21	23	200	33 .	37	39	14	43	4	45	4	9	47	&	\$	ŝ	2	25
ient of ssion. ie.)	1.º F,	01000.	=	12	13	15	17	6	22	23	24	25	92	56	27	27	90	82	8	8	2	ಜ
Co-efficient of expansion. (true.)	r. ° C.	.000188	195	220	240	256	310	355	9	418	436	451	465	474	483	492	66	808	216	521	535	550
e. sp. 87.	for 1.º F.	01000.	:	12	4	75	2	21	4	25	22	82	5	ဇ္တ	31	32	33	8	35	30	37	
Difference in sp. gr. true.	for 1 4 C.	61000.	8	33	25	27	33	38	43	9	\$	51	S	55	57	5	8	- 5	ဇ	20	8	\$
ence in sp gr. arent in glass. CORRECTION.)	for 1.º F.	000000	995	011	123	134	191	961	326	240	260	267	276	586	96	9	318	324	333	341	354	367
Difference in sp apparent in glass (= CORRECTION.)	for 1.º C.	.000162	1/1	861	221	24	301	353	404	432	467	481	497	515	533	551	572	583	299	614	627	199
Specific gravity at 15. C.= 59.° F Water at	1,0000,	1.0000	1.0123	1.0245	1.0368	1.0490	1.0620	1.0750	1.0885	1.1020	1.1155	1.1290	1.1430	1.1570	1.1710	1.1850	0661.1	1.2130	1.2265	1.2400	1.2526	1.2653
cent, of ycerin.	Per G	0	2	2	15	8	55	ဓ္က	35	\$	45	လ	55	8	જ	2	72	2	∞	8	5	8

HYDROCHLORIC ACID.

Per C		0	7	2	15	8	25	౭	35	\$	42
a apparent in glass.	For 1.º F.	60000	0	14	61	23	28	31	34	37	38
Expansion apparent i	For C. For 1. F.	91000.	61	27	45	41	S	22	9	8	69
f expansion.	For 1.º F.	01000.	12	91	20	77	56	33	36	38	40
Coefficient of expansion.	For 1.º C. For 1.º F.	881000.	215	294	369	438	523	591	040	687	712
Difference in Sp. gr. True,	For 1.º F.	01000.	13	11	23	27	33	38	7	46	84
Difference Tr	For 1. C. For 1. F.	61000.	22	31	39	84	29	38	75	90	∞
Difference in Sp. gr. apparent in glass. (=CORRECTSOM.)	lor 1.º C. For 1.º F.	g0000.	:	55	R	25	31	36	40	\$	9
	For 1.º C.	.000162	1 9	281	372	472	558	648	720	792	828
Specific gravity at 15.º ((= 59.º F.) water at some	= 1,0000.	1.0000	247	\$	743	966	.1253	515	765	2000	80
Pe C. H.C.		٥	S	2	75	8	25	ల్ల	35	\$	4

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Per		0	~	2	15	8	25	30
apparent in 168.	For 1.º F.	60000	13	17	23	28	33	39
Expansion apparent in glass.	For 1.º C. For 1.º F.	91000	23	32	42	20	59	70
f expansion.	For 1.º F.	01000	14	19	25	29	34	40
Co-efficient of expansion. True.	Fur . C. For 1.º F.	.000188	254	339	4	523	819	726
Difference in sp. gr. True.	For 1.º F	01000	14	<u>~</u>	23	27	31	36
Difference Ti	For 1.º C. For 1.º F	61000.	25	33	4	4	56	\$
in sp. gr. in glass. ECTION.	For 1. ° C. For 1. ° F.	60000	13	17	22	56	30	35
Difference in sp. gr. apparent in glass. = Correction.	For 1.º C.	291000.	222	30	396	468	\$	630
Specific gravity at 15. C. (= 59.° F.) water at same	= 1,0000).	1.0000	6466	019	436	275	123	.8977
Per Cent	h	0	S	오	15	8	25	2

ACETIC ACID.

er cent.	A	0 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
sion apparent n glass.	for 1. º F.	8217 8 22 22 22 22 22 22 22 22 22 22 22 22 2
Expansion apparent in glass.	for 1, ° C. for 1. ° F.	8 5 2 2 2 2 4 4 4 2 2 4 8 5 7 2 8 2 8 2 8 2 9 2 8 2 9 2 9 2 9 2 9 2 9
Co-efficient of expansion. (true.)	1 ° F.	0. 0.47.12.2% E.
Co-effi expar (tr)	1.° C.	23.24.3.24.3.24.3.24.3.24.3.24.3.24.3.2
Difference in sp. gr. true.	for 1.º F.	6 4 5 4 8 8 8 8 8 4 4 4 4 8 8 8 8 8 9 4 8 8 8 8
Differenc	for 1.º C.	25.5 25.5 25.5 25.5 25.5 25.5 25.5 25.5
ference in sp. gr. pparent in glass. = CONRECTION.	for 1.º F.	2000 1000 1010 1011
Difference in sp. gr. apparent in glass.	for 1°. C.	.00162 336 336 336 336 336 336 336 343 343 343
Specific gravity at 15.° C. 159.° F. Water at		1.0000 1505 1505 1505 1505 1505 1505 150
er cent.	ď	o ~ 5 ~ 5 % % % % & 4 & 5 % % % % % % % % % % % % % % % % % %

NITRIC ACID.

Per cent.		۰	Ŋ	2	15	20	25	30	35	\$	45	S	55	8	59	2	75	&	85	8	95	301
msion apparent in glass,	For 1.º F.	00000	14	23	31	39	4	46	84	8 4	49	4	20	5	52	5	85	19	† 9	99	89	2
Expansion ap	For 1.º C.	91000.	25	14	2 6	71	78	82	8	8	87	8	ર્જુ	92	\$	86	105	011	711	120	122	126
of expansion ie.	For 1.º F.	01000	15	24	33	4	45	47	6	49	2	51	51	53	45	56	9	62	65	89	(°)	11
Co-efficient of expansion True.	For r. C.	.000188	271	435	288	733	8	850	188	968 068	668	913	616	956	996	20100.	10701	1122	1169	1221	1241	1284
	For 1.º F.	01000.	15	26	36	46	52	Se	3	62	64	- 62	3	72	75	7.9	98	16	96	10100	tel	100
Difference in sp. gr. True.	For 1. 9 C.	91000.	28	46	64	83	93	00100	107	111	115	120	124	130	135	142	155	†9 1	173	182	188	161
ence in sp gr. apparent.	For 1.º F.	60000	7	24	34	7	20	45	88	3	(02	65	67	20	73	87	83	8	7	×	.00103	102
Difference in sp g apparent. (=Correction.)	For 1.8 C.	.000162	252	432	612	262	8	972	40100.	0801	9111	1170	1206	1260	1314	1386	1512	1602	1692	1782	1830	1926
Sp. gr. at 15. C. (= 59. F.) water at	1.000.	1.0000	.0287	.0584	6880.	1201	.1521	0481.	9212.	. 2509	. 2845	.3172	.3470	.3741	3996	.4233	.4423	.4597	.4707	. 1938	5116	.5300
Per cent. HNO3.		0	S	0	15	20	25	30	35	6	45	20	55	8	65	20	75	æ	8.	ð,	95	8

PHOSPHORIC ACID.

Per cent. HaPO4,	i	0	S	2	15	8	25	ည	35			င္သ	55	8	5	2	72	&	š
apparent	for 1.° F.	.000.	2	12	15.	15	17	61	8	21	75	22	5 3	7	24	252	9	77	23
Expansion apparent in glass.	for 1.9 C.	91060.	% 1	21	56	82	31	34	35	37	39	9	42	43	4,	94	8	43	39
c.o-efficient of capanyon, true,	· .	01000	:		91	17	61	25	21	22	23	24	25	25	56	27	27	25	77
Co-effic capai tr	1.º C.	881000	203	238	286	302	335	362	380	6	416	428	‡	452	463	482	96	452	420
e in sp. gr., true,	for 1.º F.	01000	13	14	17	61	22	2	20	58	တ္တ	35	34	30	38	41	43	4	41
Difference in sp. true.	r 1.º C.	01000.	22	56	ဇ္တ	39	33	43	41	- IS	54	8	62	2	8	74	79	75	73
in sp. gr. in glass. cri N.)	for 1 % F.	60000	0	12	15	17	20	22	77	50	78	30	32	34	36	36	14	39	300
Difference in sp. gr apparent in glass. (== CORRFCT1 N.)	for 1.° C.	91000.	50	£.	27	31	36	9	43	47	S	54		19	\$	2	74	2	જ
Specific gravity at 15 °C, =59.°F) Water at same temp. == 1,000.		1,0000	.0283	.0577	.0882	. 1201	.1535	. 1889	.2260	.2645	.3050	.3479	.3932	.440	8064.	.5426	. 5963	.6529	2017.
Per cent. H ₃ PO4		0	2	01	15	20	25	30	35	6	45	20	55	8	65	2	75	æ	×

SULPHURIC ACID.

er cent. H ₂ SO4.	A I	0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
sion apparent in glass.	for 1 F.	000 000 000 000 000 000 000 000 000 00
Expansion apparent in glass.	for 1.º C.	5.5 % 4 4.4 1.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2
ient of sion. e.	I. P.F.	0 55 12 4 28 88 88 88 88 88 88 88 88 88 88 88 88
Co-efficient of expansion, true.	1.º C.	88 88 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
e in sp. gr., true.	for 1.9 F.	55 2 2 2 8 8 8 8 8 8 4 4 4 4 8 8 8 8 8 2 2 2 8
Difference in sp. true.	for 1.º C.	00 00 00 00 00 00 00 00 00 00 00 00 00
apparent, in glass, (= correction.)	for 1.° F.	0000 0000 0000 0000 0000 0000 0000 0000 0000
Ð	for 1.° C,	2000 270 350 450 504 504 501 617 756 776 776 776 776 776 776 776 776 77
Specific gravity at 15. C. = 59.° F. Water at		0.000.1 0.033 0.045 0.045 0.05
er cent. H2SO4.	g I	0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

In Memoriam.

CARL RIEBE was born at Brandenburg, Germany, Dec. 6th, 1852. Entered the German Marine, in April, 1869; was advanced to the rank of Sea Cadette in July, 1870, and was appointed Lieutenant in Dec., 1873. March, 1878, until Sept., 1881, he occupied a position as an officer on various steamers of the North German Lloyd. In Oct., 1881, he entered the Pharmacy Department of the U. of M. In Dec., 1882. he entered the employ of Messrs. C. Eberbach & Son, of Ann Arbor, where he remained until June, 1884, meanwhile pursuing his studies at the University, graduating from the Pharmacy Department, with the class of '84. Immediately after graduating he accepted a position in one of the leading pharmacies of Chicago, where he remained until his health became so impaired that he was obliged to leave, returning to Ann Arbor where he died on the 10th of August, 1885.

Mr. Riebe joined our Association at its organization at Lansing and read the first paper before the new Association on the subject of Medicated Syrups and Waters. He exhibited some samples made after the formula he recommended. Again, at our meeting, in 1884, Mr. Riebe contributed an interesting paper on Sulphurous Acid. He was a close student and a hard worker, and by his death our Association has lost a most valuable member, and to the profession is lost one who bid fair by his life and work to add not a little to its character as a responsible and highly honorable calling.

EDWARD B. ESCOTT was born in Bristol, England, October 23, 1822, and came to America in 1842, settling in Detroit, where he resided until 1858. In 1858, he was married to Mary C. Daniells at Wacousta, Clinton county, and came to Grand Rapids. In 1862, he engaged in the drug business on Canal street, near Bronson street, and later, opened a branch store at No. 14, Canal street. He died Nov. 5, 1884.

In the death of Mr. Escott, our society loses one of its oldest members, he having been engaged in the drug business for twenty-three years.

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du Memorian

Mr. HENRY BETTS PARSONS died on Friday, August 21, 1885, at Tucson, Arizona.

Mr. Parsons was born November 20, 1855, at Sivas, Asia Minor. Came to this country in 1859. From the time he was sixteen years of age he showed an aptness and liking for chemistry. He graduated from the School of Pharmacy of the University of Michigan in 1876, and remained two years longer in the University as assistant in Pharmacy. In 1878 he went to Washington as special assistant in the chemical division of the Agricultural De partment. Soon after he accepted the professorhip of Materia Medica and Botany in the National College of Pharmacy. He resigned his position in Washington in 1881 to accept the superintendence of the laboratory and drug mills of W. F. Schieffelin & Co., of New York. August, 1883, he was married to Annie F. Taylor, of Ann Arbor. In May, 1884, he was obliged to give up his laboratory work on account of serious lung trouble and accepted the editorship of the Druggists' Circular which he conducted in a masterly manner until May, 1885, when he went to Arizona to regain, if possible, his health. he remained until the time of his death.

Mr. Parsons had a world-wide reputation as a chemist of more than ordinary ability and his contributions to chemical and pharmaceutical literature have been numerous and of permanent value. In his death chemistry and pharmacy have suffered a loss which will be long felt and deeply mourned, and our Association one of its most highly honored members.

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A QUESTION BOX.

At the next annual meeting, members will be invited to present practical questions, placed with signature in a Question Box, to be read without signature for open reply by the members present. At the close of each session the box will be opened and the questions read, to be taken up for reply in the next session, or as determined in the order of exercises.

QUERIĘS.

To be Reported upon at the Fourth Annual Meeting, to be held in Grand Rapids October 12, 13 and 14, 1886.

- 1. Does the present pharmacopeial formula for syrups of the phosphates of iron, quinine and strychnine yield a satisfactory product?
- 2. What are the best materials and proportions for gelatine suppositories and pencils?
- 3. Is the use of coloring in elixirs and medicinal syrups a defensible practice?
- 4. What articles and mixtures are liable to cause explosions in dispensing pharmacy? Accepted by Augustus Ahlborn, Detroit.
- 5. What is the quality of the iodoform in use? Accepted by J. R. Conrads.
- 6. What strengths of tincture of opium are furnished in pharmacy in this state?
 - 7. What are the causes of the variations in color of tincture of opium?
- 8. Of what strength of morphine is the camphorated tincture of opium dispensed in this state?
- 9. How does the spirit of camphor used in filling physicians' prescriptions compare in strength with present pharmacopoial requirements?
- 10. Should the use of powdered extracts in place of ordinary solid extracts be encouraged?
- 11. A microchemical examination of sulphate of morphine. Accepted by G. A. Bowdish.

- 12. What are the uses of petrolatum and of paraffin oil in ointments liniments, etc?
- 13. An examination of the granular effervescent salts of the market is desired.
- 14. What is the quality of the pressed herbs, more especially those of narcotic effect, as found in drug stores in this state? Accepted by A. B. Lyons, Detroit.
 - 15. What drugs should be employed only in the green state?
 - 13. What merits have the "concentrations" of the market?
- 17. What nomenclature is most desirable for the "concentrations" and "resinoids?"
- 18. An investigation of the alleged incompatibility of chloral hydrate and potassium bromide with alcohol is desired.
- 19. What is the quality of the citrate of caffeine of the market. Accepted by O. Scherer.
- 20. Can the formula of the U. S. Ph., 1889, for fluid extract of ipecacuanha be improved?
- 21. What are the limits of error in estimating alcohol by distillation? Accepted by G B. Daniels.
- 22. What cooperative measures may the druggists of our state adopt by which their business interests may be advanced?
- 23. What disinfectant and antiseptic preparations can the dispensing pharmacist make with advantage?
- 24. A report is desired upon the measures of weight and volume, absolute and proportional, to be recommended for the next pharmacopæia. Accepted by Λ . B. Lyons, Detroit.
- 25. How does Kerner's test for sulphate of quinine compare with other recent methods? Accepted by R. R. Stivers.
- 26. What instruments and methods of taking specific gravities are most serviceable to the pharmacist?
- 27 A report is requested upon the means of increasing the efficiency of pharmaceutical employés, and their skill in applied pharmacy.
- 28. What course of reading and plan of study are advisory for the assistant in pharmacy? Accepted by A. B. Prescott.
- 29. Solid extracts vary greatly in strength. What are the causes of the variations and how can uniformity be secured? Accepted by H. W. Snow, Detroit.
- 30. What proportion of solid extract should be yielded by various drugs? Is it practicable to standardize these extracts so that one part of the extract shall represent five parts of the drug?
- 31. Alkaloidal valuations of fluid extract of veratrum veride are desired.
- 32. For what preparations of the pharmacopæia is an alkaloidal standard to be advised, and on what principle in general should the proposed standard be fixed?

- 33. Is the U. S. Ph. process for extract of physostigma the best one? Do the preparations in the market agree in character with the official product?
- 34. Alkaloidal valuations of fluid extracts of aconite and nux vomica are desired. Accepted by A. B. Stevens, Detroit.
- 35. Alkaloidal valuations of fluid extracts of belladonna and hyoscy-ainus are desired.
- 36. What is the character of the powdered extracts of cannabis indica offered at present? Accepted by L. C. Finch, Detroit
- 37. What is the active principle of phytolacca root? Accepted by Wm. Scanlon, Bear Lake.
- 38. What is the poisonous principle of loco-weed. Accepted by A. B. Stevens, Detroit.
- 39. What medicinal plants are indigenous to the vicinity of Ann Arbor? Accepted by J. W. and W. P. Doty.
- 40. Is an apprentice in a drug store entitled to receive instruction in practical pharmacy from his employer, and to what extent is the latter held to grant a reasonable time for daily study? Accepted by J. F. Rumer. Richfield.
- 41. By what means can those entering upon the practice of pharmacy in the state be ensured to have a close acquaintance with the United States Pharmacopoeia?
- 42. It is desired to have a series of experiments on the solubility of hydrated oxide of iron in citric acid, with respect to temperature.
- 43. How does the purity of artificial salicylic acid compare with that of the natural? Accepted by E. A. Ruddiman.
- 44. What is the strength of pepsins of the market, and what improvement can be made in the assay of pepsins? Accepted by N. Van den Belt, Detroit.
- 45. What improvement, if any, can be made in the present pharmacopæial preparation of fluid extract of ergot? Accepted by E. C. Federer, Detroit.
- 46. Gelsemium: is there any foundation for the preference given by some physicians to preparations made from the green drug?
 - 47. What is the poisonous constituent of nutmeg, and its power?
 - 48. What are the active principles of rhamnus purshianus?
- 49. Does the compound spirit of ether usually dispensed fulfil the requirements of the pharmacopæia of 1880?
- 50. What is the strength and purity of the spirit of nitrous ether and concentrated nitrous ether of the drug trade? Accepted by H. K. Eaton.
 - 51. What is the quality of the menthol cones now furnished?
- 52. What is the strength and purity of the acetic acid of pharmacy in this state? Accepted by George Gundrum, Ionia.

- 53. What is the character of the concentration, euonymin, as furnished?
- 54. What is the proportion of oxidized mercury in mercury with chalk? Accepted by O. C. Johnson, Ann Arbor.
- 55. What poisons, if any, do colored flannels contain? Accepted by W. A. Zimmer.
- 56. What improvements can be made in the estimation of alkaloids by Meyer's Reagent? Accepted by E. W. Clark.
- 57. To what extent is the metric system now used by physicians? Accepted by C. G. Stone, Detroit.

CONSTITUTION AND BY-LAWS,

Adopted at Lansing, Mich., November 15, 1883.

PREAMBLE.

Whereas, Organization, concert of action and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmacentical Association will accomplish these objects, therefore,

Resolved, That we, druggists of the State of Michigan, in convention assembled at Lansing, organize ourselves into such an Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmaceutical Association.

ARTICLE II.

The objects of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard and ultimately to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.

MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.

OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer and an Executive Committee of five members, all of whom shall be elected at the regular annual meeting of the Association by ballot, and to serve until their successors are elected.

ARTICLE V.

DUTIES OF OFFICERS.

SECTION 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, call special meetings at the written request of twenty-five members, shall present at each meeting a report of the Association and perform such other duties as pertain to the office.

SEC. 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting; at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts, keep a correct

account thereof, and pay the same to the Treasurer, taking his receipt therefor. He shall give a sufficient bond, subject to the approval of the committee.

- SEC. 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury, when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.
- SEC. 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.
- SEC. 5. It shall be the duty of the Executive Committee to aid the Local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.

MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.

BY-LAWS.

This Association may establish for its future government and regulation such By-Laws not in conflict with this Constitution as may be deemed proper and desirable.

ARTICLE VIII.

AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.

QUORUM.

Twenty members shall constitute a quorum.

ARTICLE II.

MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy shall be presented to the Association in writing, signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee, the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for election.

ARTICLE III.

FEES.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary, and the applicant shall subscribe to the Constitution and By-Laws before the end of the next annual meeting.

ARTICLE IV.

DUES.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.

CERTIFICATE OF MEMBERSHIP.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership which shall be issued by the Secretary, provided said member is not in arrears for dues.

ARTICLE VI.

COMMITTEES.

- SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees, (of which he shall be an ex-officio member,) each to consist of three members, viz: Committee on Trade Interests, Committee on Pharmacy and Queries, Committee on Legislation.
- SEC. 2. Committee on Trade interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.
- SEC. 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable to be reported upon at the next annual meeting.
- SEC. 4. The Committee on Legislation shall keep a record of and compile, for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.

SUSPENSIONS-AMENDMENTS.

- SECTION 1. These By-Laws shall not be suspended without the consent of two-thirds of the members present.
- SEC. 2. Any amendment to these by-laws must be made in writing, and read before the Association at one sitting, and

laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these by-laws.

ARTICLE VIII.

DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meetings of the American Pharmaceutical Association; also, to attend the National Retail Druggists' Association.

ARTICLE IX.

PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees and members shall be published annually under the supervision of the Secretary and Executive Committee, and a copy of the proceedings sent to each member of the Association.

ARTICLE X.

SUSPENSION OF MEMBERS.

Any member may be expelled for improper conduct or any officer removed from office, for violating the constitution or by-laws, but no person shall be expelled or removed except by a two-thirds vote of all the members present at a regular meeting, and after he shall have been given an opportunity to be heard in his own defense.

ARTICLE XI.

EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meeting, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.

RULES OF ORDER-ORDER OF BUSINESS.

SECTION 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SEC. 2. The Order of Business shall be as follows:

- 1. Calling roll of members.
- 2. Reading of minutes of previous session.
- 3. Address of retiring President.
- 4. Applications for membership.
- 5. Election of members.
- 6. Reports of officers and committees.
- 7. Miscellaneous business.
- 8. Reading of communications.
- 9. Election of officers.



ROLL OF MEMBERS.

[Members are requested to notify the Secretary of any change in address, death of members in their locality, or errors in the roll.]

Adams, C. H	Otsego,	1884
Adamson, J. W		
Ahlborn, Augustus		
Akey, J. V		
Aldworth, F. G.		
Alexander, A. P		1884
Allen, A. W	Detroit, 410 G'd River Ave	1883
Allen, E. F	Boyne City,	1885
Alsdorf, F. M	Lansing,	1883
Anderson, Ellery		
Anderson, Maxon	Midland,	1884
Andrews, S. N	Flint,	1884
Andrus, C. S	Detroit, 1151, Jeff. Ave	1885
Andrus, W. S		
Arbour, Henry	Muir,	1884
Arbour, M. T	Orangeville Mills,	1884
Arnold, W. C	Ludington,	1885
Atwater, C. H		
Baar, Henry,	Grand Haven	1885
Babbington, John,		
Baier, C. G		
Bachman, M. H		
Bailey, G. H		
Bahel, C. W		
Baker, Dennis		

Baker, W. H	Whitehall	1885
Baldwin, E. L	Detroit. (C. Wright & Co.,)	1884
Bangs, W. Z	Holland	1885
Banks, A. W	Detroit, Fort St. west	1883
Bannard, H. F		
Barbour, F. S	Clifford	1884
Barbour, W. G	Saginaw	1885
Barrows, J. F	Lawrence	1885
Barbarin, G. F	Freeland	1885
Bartram, E. W	Paw Paw	1883
Bassett, A	Detroit	1884
Bassett, E. C	South Lyon	1884
Bassett, J. A	Detroit (J. E. Davis & Co.	1885
Bauer, A. C		
Baxter, T. H		
Beach, L. T		
Beachum, C. B	Romeo	1884
Beebe, Hosmer		
Belsher, W. E		
Bence, G. W		
Bennett, J. R		
Bennett, L. T. E	Port Huron	1885
Bertram, Julius	Alpena	1884
Bertram, J. P	Westphalia	1883
Bessac, H. B		
Begelow, C. P	Grand Rapids	1884
Bigelow, W. H	Owosso	1884
Bigg, A. H		
Bird, C. E	Saugatuck	1884
Bird. jr., Henry	Douglas	1884
Birge, W. E	Kalamazoo	1884
Bisbee, A. B	Benton Harbor	1885
Blacklay, T. L	Jones	1884
Blackmer, H. A	Charlotte	1884
Blair, C. A	Morenci	1885
Blakeslee, L. G	Detroit, 177 Griswold St	1885
Blocher, Charles	Millington	1885
Bolio, Oliver	Detroit, Michigan Ave	1884

Bond, E. C	Muskegon	1885
Bower, Manley		
Braddock, O. L	South Bay City	1885
Bridgeman, M. L		1884
Briggs, J. W		1883
Bristol, F. E	Lapeer	1884
Bristol, U. D		1884
Brooks, Chas	East Saginaw	1884
Brown, D. D	Kalamazoo	1885
Brown, H. J	Ann Arbor	1883
Brown, I. V		1883
Brown, J. J	Okemos	1883
Browning, G. B	Decatur	1885
Bruske, R	East Saginaw	1885
Buchanan B. F	Harrisville	1883
Buchanan, S. C	Harrisville	1885
Bugbee, C. A	Cheboygan	1885
Bullard, E. A	Vassar	1883
Bullock, S. V	Howard City	1884
Burdick, H. H	Bay City	1884
Burroughs, C. S	Clinton	1884
Burwell, R. G	Fort Gratiot	1884
Cady, G. F		1883
Cahalan, J. C		1884
Caldwell, G. G		1885
Caldwell, J. W	Detroit, 242 G'd River Ave	1884
Calkins, H. W	Detroit	1883
Calkins, S. B	Petoskey	1885
Cameron, Alexander	Walton	1885
Carman, N. F	Lansing	1883
Carney, M. S		
Carpenter, A. D	Mancelona	1885
Carrier, Hubert		
Carroll, M. A		
Carroll, Watson		
Chamberlain, G. T	Hartford	1883
Chamberlain, M	Horton	1884

		
Champney, A. R I	Detroit, 709 Wood'wd Ave	1883
Chandler, C. A	Cambria Mills	1884
Church, H. M I	Holly	1884
Clark, A. G	White Cloud	1883
Clarke, J. F		1884
Clark, J. K I	Blissfield	1884
Clarke, W. G I	Detroit, 288 Baker st	1885
Clark, Louis K		1884
Clark, S. U		1885
	Widdlev i lle	1884
Claxton, W. C I	•	1885
Cleland Henry I		1885
Cleveland, H. W		1884
Coe, T. D.: 1		188 F
Coffin, C. L I		1885
Cole, Levi W I		1885
Cole, W. W		1885
Coleman, G. E I		1885
Coleman, H. G I		1884
Coman, L. S		1884
	Stephenson	1883
Connine, Dewitt		1885
Connell, F. G. L I	*	1884
Conway, V. R		1885
Cook, C. E		1884
Cooper, D. M		1884
Cooper, I. S		
Cornell, E. A		
Couturier, Noel		
Covert, C. F		
Crawford, J. B		
Cross, F. E		
Crouter, G. W		
	Detroit, 425 Mich Ave	
	St. Joseph	
•	St. Clair	
Curtis, C. A		
Curtis, F. E	Napoleon	1885

Cutler, W. R	Ionia	1883
Cushman, H. D	Three Rivers	1884
Cummer, R. J	Cadillac	1884
Dahm, A. C	Mt. Clemens	1884
Damon, J. A	Millington	1884
Davis, F. S	Ypsilanti	1885
Davis, (4. L	Lansing	1883
Davis, James E	Detroit	1884
Deitz, G. A	Cadillac	1883
DeBoe, John	Grand Rapids	1884
Demerest, W. M	Webberville	1884
Dewey, C. C		1885
Dickinson, O. B.		
Dimiek, S. H		
Dodge, E. L		
Dodd, I. LeRoy H		
Dodds, J. J		
Dodds, W. H		
Dorrance, A. A		
Douglass, F. M		
Dunbar, R. H		
Dunlap, Thomas		
Dunlop, J. W		
Dunn, G. B		
Dunning, N. A		
Dupont, Wm	Detroit, 182 Mich. Ave	1883
p,	, <u></u>	
Eberbach, O	Ann Arbor	1883
Eckerman, A		
Eldred, B. C		
Elliott, R. H		
Empey, M. C		
Emster, F. H. J. van		
Escott, F. H		
Escott, L. W		
Erskine, James		
Everhart, James		
		_000

Falk, W. B	Howard City	1885
Farnham, E	Casnovia	1885
Fales, F. R	Metamora	1884
Farrand, J. S	Detroit	1884
Fasquelle, L. J	St. Johns	1885
Fatin, C. A	Almont	1885
Fehlig, jr., H. J	Belleville	1884
Feldman, Henry	Sault Ste Marie	1885
Fellows, C. A	Big Rapids	1884
Fenton, Geo. L	Kingsley	1885
Filduo, A. S	St. Johns	1884
Fincher, F. W	Pentwater	1883
Fink, Leon C	Detroit, Parke, Davis & Co.	1884
Fisk, C. A. E	Mancelona	1885
Foot, Wm. H	East Saginaw	1884
Fordham, M	Elmira	1885
Fordham, W. W	Traverse City	1884
Forrest, G. W	Chase	1883
Foster, W	West Branch	1884
Fournier, Lucien	Bay City	1884
Francis, J. L	Ypsilanti	1883
Frank, H. A	Detroit, 291 Congress St.	1883
Fritz, T. H	Cass City	1885
Frizelle, C. L	Detroit, Mich. Ave	1884
Frizelle, S. F	Detroit, Mich. Ave	1884
Fulton, Robert	Detroit, 375 Baker St	1884
Fuqua, C. B	Detroit	1884
Gahan, D. J	Flint.	1884
Gallinger, E. L		1885
Gardner, A. R	Fowlerville	1884
Gates, E. M		1885
Gates, T. O		1884
Gebhard, A. E		1883
Gerow, J. E		1883
Gibbs, N. C		1884
Gill, W. J		1884
Gladding, B. O		1883
Ommune, D. O	COLDONAL VALCOURING THE STATE OF THE STATE O	1000

Glazier, F. P	Chelsea	1885
Gleason, E. G	Richmond	1884
Goldsmith, G. S	Manistee	1885
Goodrich, L. C	Kalkaska	1883
Goodrich, L. A	Hillsdale	1884
•	Jasper	1884
Goodyear, J. J	Ann Arbor	1883
Goodyear, W. H	Hastings	1885
Gorsueh, C. H	Waldron	1885
Gover, G. H	Leaton	1884
Grandy, Francis	Fairfield	1885
Graydon, G. H	Detroit, J. J. Dodds & Co.	1885
	Ann Arbor	1883
Gregory, A. W. C	Albion	1884
Griffith, W. II	Howell	1883
	Ovid	1885
Grosse, W. F	Sault Ste Marie	1885
Grunow, O. H	Detroit, 81 Woodward Ave	1884
Gundrum, Geo		1883
Haan, G. T	Grand Rapids	1884
Haenssler, G. J	Manchester	1885
Hale, H. G	Nashville	1883
Hall, J. L	Chatham, Ont	1885
Hall, J. W	Hudson	1884
Hall, W.A	Greenville	1884
Haller, J. P	Sault Ste. Marie	1885
Hallock, D. G	Detroit, 760 Fort st. west	1884
Halsey, L. J	Utica	1884
Hamilton, C. W	St. Charles	1883
Hamilton, H. G	East Saginaw	1884
Hamlen, R. J	Detroit, Fort and 7th sts.	1885
Hanlon, Amos	Middleville	1884
Happy, Charles	Maybee	1885
Harper, J. C	Milan	1884
Harris, D. S	Ypsilanti	1884
Harrison, B. D	Barron, Wis	1885
Harrison D. A.	Kalamazoo	1884

Harrison, H. E	Richmond	1884
Harshaw, W. D	Pontiae	1885
Hartz, H. T	Detroit, 81 Wood'd Ave	1884
Hastings, R. A	Sparta	1884
Harvey, E. C. T	Port Huron	1885
Harvey, H. D	Bangor	1883
Harvey, S. K	Detroit, T. H. H. & Sons	1884
Harvey, T	Farmers	1884
Harwood, G. M	Petoskey	1884
Harwood, Henry	Ishpeming	1885
Hawkins Henry	Detroit, Hastings st	1883
Heath, Fred	Muskegon	1884
Hedges, H. C	North Lansing	1884
Heimbach, S. J.		1884
Hendrick, F. H	Stanton	1883
Herley, M. L		1883
Herrington, C. H	Belleville,	1884
Herrington, J. A	Belleville	1884
	Rockford	1884
Hewett, J. S	Milford	1884
Hewett, L. E	Lansing	1883
Heysett, William	Ludington	1885
	Evart	1884
Hicks, W. H	Morley	1883
Hicks, W. L	•	1885
Higgins, D. W		1884
	Detroit	1885
Hipkins, E. S		1883
•	Manistee	1885
Hogeboom, J. G	Saginaw	1884
Hogguer, F. F. W	Detroit, 20 Monroe Ave .	1884
Hogle, J. L	Farmington	1884
Holt, A. E	Detroit	1885
Hopkins, I. F	Muskegon	1884
Horner, D. A	<u>.</u>	1884
Hotchkiss, F		1884
Houp, Frank		1884
Howard Charles		1885

Howard, W. S. St. Joseph			
Hueston, G. C. Northville 1885 Hullinger, James Big Rapids 1883 Hutton, R. J. Detroit, 425 Antoine St 1885 Humphrey, C. E. Jackson 1883 Hungerford, C. B. Northville 1885 Hunt, A. O. St. Johns 1885 Hunter, J. E. Grand Rapids 1884 Hutchings, Wm Leslie 1884 Hurd, A. E. Davison Station 1884 Hurd, C. W. Davison Station 1885 Hurd, J. E. Detroit, 99 Woodward Ave 1884 Hyde, A. O. Marshall 1883 Hyde, H. J. Marshall 1884 Hyde, W. L. Marshall 1884 Hyde, W. L. Marshall 1884 Hynes, Quincy Hastings 1885 Inglis, Frank Detroit, Griswold St. 1883 Ingram, E. J. Iron Mountain 1883 Johnson, C. B. Palo 1884 Johnson, J. G. Traverse City 1884 Johnston, A. M. Toronto, Canada 1885 Johnst			
Hullinger, James Big Rapids 1883 Hutton, R. J. Detroit, 425 Antoine St. 1885 Humphrey, C. E. Jackson 1883 Hungerford, C. B. Northville 1885 Hunt, A. O. St. Johns 1885 Hunter, J. E. Grand Rapids 1884 Hutchings, Wm Leslie 1884 Hurd, A. E. Davison Station 1884 Hurd, C. W. Davison Station 1885 Hurd, J. E. Detroit, 99 Woodward Ave 1884 Hyde, A. O. Marshall 1883 Hyde, H. J. Marshall 1884 Hyde, W. L. Marshall 1884 Hynes, Quincy Hastings 1885 Inglis, Frank Detroit, Griswold St. 1883 Ingram, E. J. Iron Mountain 1883 Jefts, Willard Big Rapids 1884 Jesson, Jacob Muskegon 1883 Johnson, C. B Palo 1885 Johnson, J. G Traverse City 1884 Johnston, A. M Toronto, Canada 1885 Johnst			
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Hungerford, C. B. Northville. 1885 Hunt, A. O. St. Johns. 1885 Hunter, J. E. Grand Rapids. 1884 Hutchings, Wm. Leslie. 1884 Hurd, A. E. Davison Station. 1884 Hurd, C. W. Davison Station. 1885 Hurd, J. E. Detroit, 99 Woodward Ave 1884 Hyde, A. O. Marshall 1883 Hyde, H. J. Marshall 1884 Hyde, W. L. Marshall 1884 Hynes, Quincy Hastings 1885 Inglis, Frank Detroit, Griswold St. 1883 Ingram, E. J. Iron Mountain 1883 Jefts, Willard Big Rapids 1884 Jesson, Jacob Muskegon 1883 Johnson, C. B Palo 1884 Johnson, J. G Traverse City 1884 Johnston, A. J Detroit, 271 Gratiot Ave. 1885 Johnston, Wm Detroit 271 Gratiot Ave. 1884 Johnston, W. S Detroit, 271 Gratiot Ave. 1884 Johnston, O. C St. Johns	Hutton, R. J	Detroit, 425 Antoine St	1885
Hunt, A. O. St. Johns. 1885 Hunter, J. E. Grand Rapids. 1884 Hutchings, Wm Leslie. 1884 Hurd, A. E. Davison Station. 1885 Hurd, C. W. Davison Station. 1885 Hurd, J. E. Detroit, 99 Woodward Ave 1884 Hyde, A. O. Marshall 1883 Hyde, H. J. Marshall 1884 Hyde, W. L. Marshall 1884 Hynes, Quincy Hastings 1885 Inglis, Frank Detroit, Griswold St. 1883 Ingram, E. J. Iron Mountain 1883 Jefts, Willard Big Rapids 1884 Jesson, Jacob Muskegon 1883 Johnson, C. B Palo 1884 Johnson, J. G Traverse City 1884 Johnston, A. J Detroit, 271 Gratiot Ave. 1885 Johnston, Wm Detroit 271 Gratiot Ave. 1884 Johnston, W. S Detroit, 271 Gratiot Ave. 1884 Johnston, W. S Detroit, 271 Gratiot Ave. 1884 Johnston, O. C St. Johns	Humphrey, C. E	Jackson	1883
Hunter, J. E Grand Rapids. 1884 Hutchings, Wm Leslie. 1884 Hurd, A. E Davison Station. 1885 Hurd, C. W Davison Station. 1885 Hurd, J. E Detroit, 99 Woodward Ave 1884 Hyde, A. O Marshall. 1883 Hyde, H. J Marshall. 1884 Hyde, W. L Marshall. 1884 Hynes, Quincy. Hastings. 1885 Inglis, Frank. Detroit, Griswold St 1883 Ingram, E. J Iron Mountain 1883 Jefts, Willard. Big Rapids. 1884 Jesson, Jacob. Muskegon 1883 Johnson, C. B. Palo 1884 Johnson, J. G. Traverse City 1884 Johnston, A. J. Detroit, 271 Gratiot Ave. 1885 Johnston, Wm. Detroit. 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Johnston, O. C. St	Hungerford, C. B	Northville	1885
Hutchings, Wm. Leslie	Hunt, A. O	St. Johns	1885
Hurd, A. E. Davison Station	Hunter, J. E	Grand Rapids	1884
Hurd, C. W. Davison Station. 1885 Hurd, J. E. Detroit, 99 Woodward Ave 1884 Hyde, A. O. Marshall 1883 Hyde, H. J. Marshall 1884 Hyde, W. L. Marshall 1884 Hynes, Quincy Hastings 1885 Inglis, Frank Detroit, Griswold St. 1883 Ingram, E. J. Iron Mountain 1883 Jefts, Willard Big Rapids 1884 Jesson, Jacob Muskegon 1883 Johnson, C. B Palo 1885 Johnson, J. G Traverse City 1884 Johnson, O. C Ann Arbor 1884 Johnston, A. J Detroit, 271 Gratiot Ave. 1885 Johnston, Wm Detroit 271 Gratiot Ave. 1884 Johnston, W. S Detroit, 271 Gratiot Ave. 1884 Jones, E. L Battle Creek 1883 Joslen, O. C St. Johns 1884	Hutchings, Wm	Leslie	
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Ingram, E. J. Iron Mountain 1883 Jefts, Willard Big Rapids 1884 Jesson, Jacob Muskegon 1883 Johnson, C. B Palo 1885 Johnson, J. G Traverse City 1884 Johnson, O. C Ann Arbor 1884 Johnston, A. J Detroit, 271 Gratiot Ave. 1885 Johnston, A. M Toronto, Canada 1885 Johnston, Wm Detroit, 271 Gratiot Ave. 1884 Jones, E. L Battle Creek 1883 Joslen, O. C St. Johns 1884		-	
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Jesson, Jacob. Muskegon 1888 Johnson, C. B. Palo 1885 Johnson, J. G. Traverse City 1884 Johnson, O. C. Ann Arbor 1884 Johnston, A. J. Detroit, 271 Gratiot Ave. 1885 Johnston, Wm Detroit 1884 Johnston, Wm Detroit 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Jones, E. L. Battle Creek 1883 Joslen, O. C. St. Johns 1884			
Jesson, Jacob. Muskegon 1888 Johnson, C. B. Palo 1885 Johnson, J. G. Traverse City 1884 Johnson, O. C. Ann Arbor 1884 Johnston, A. J. Detroit, 271 Gratiot Ave. 1885 Johnston, Wm Detroit 1884 Johnston, Wm Detroit 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Jones, E. L. Battle Creek 1883 Joslen, O. C. St. Johns 1884	Jefts. Willard	Big Rapids	1884
Johnson, C. B. Palo 1885 Johnson, J. G. Traverse City 1884 Johnson, O. C. Ann Arbor 1884 Johnston, A. J. Detroit, 271 Gratiot Ave. 1885 Johnston, A. M. Toronto, Canada 1885 Johnston, Wm Detroit 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Jones, E. L. Battle Creek 1883 Joslen, O. C. St. Johns 1884			
Johnson, J. G. Traverse City			
Johnson, O. C. Ann Arbor 1884 Johnston, A. J. Detroit, 271 Gratiot Ave. 1885 Johnston, A. M. Toronto, Canada. 1885 Johnston, Wm. Detroit. 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Jones, E. L. Battle Creek. 1883 Joslen, O. C. St. Johns. 1884			
Johnston, A. J. Detroit, 271 Gratiot Ave. 1885 Johnston, A. M. Toronto, Canada. 1885 Johnston, Wm. Detroit. 1884 Johnston, W. S. Detroit, 271 Gratiot Ave. 1884 Jones, E. L. Battle Creek. 1883 Joslen, O. C. St. Johns. 1884			
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Jones, E. L. Battle Creek 1883 Joslen, O. C. St. Johns 1884			
Joslen, O. C St. Johns 1884			
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Kay, G. A Detroit, 693 Mich. Ave 1885	Kay, G. A	Detroit, 693 Mich. Ave	1885
Kay, W. J 1884			
Keeler, W. H Saginaw	Keeler, W. H	Saginaw	1888
Kelly, F. H Au Sable 1885			

Kellogg, David Lyons	
Kellogg, J. H East Saginaw	84
Kellogg, J. L East Saginaw 18	85
Kemink, Theo Grand Rapids 18	84
Kennedy, E. J Detroit, 709 Wood'wd Ave 18	84
Kenrick, E. H Hillsdale	
Kenryon, W. W Howell 18	
Kephart, H Berrien Springs 18	83
Kephart, W Berrien Springs 18	84
Kibbee, A. D Custer 18	84
Kidd, A. J Benton Harbor 18	85
Kinsball, J. L Crystal Falls	34
Kintnont, B. F Tekonsha 18	84
Kipp, F. E Grand Rapids 18	84
Kirkwood, C. H Ishpeming	
Kirkwook, P. B Negaunee	
Kirtland, J. W Lakeview	85
Klingman, Theophil Dexter 18	85
Keen, C. S Lisbon 18	85
Ketcher, C. W Detroit	84
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Lacy, E. M Sault Ste Marie 18	8 4
Lacy, E. M. Sault Ste Marie. 18 Lane, I. D. Sand Beach. 18 La Rue, C. M. West Bay City. 18	84
Larre, I. D Sand Beach	84 85
La Rue, C. M. Sand Beach 18 La Rue, C. M. West Bay City 18 Lambert, B. L. Detroit, J. J. Dodds & Co. 18	84 85 84
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Lane, I. D. Sand Beach 18 La Rue, C. M. West Bay City 18 Lambert, B. L. Detroit, J. J. Dodds & Co. 18 Lamoreux, John Lakeview 18 Lamoreux, Sarah A. Lakeview 18	84 85 84 84 84
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Lame, I. D. Sand Beach 18 La Rue, C. M. West Bay City 18 Lambert, B. L. Detroit, J. J. Dodds & Co. 18 Lamoreux, John Lakeview 18 Latimer, F. N. Ludington 18	84 85 84 84 83 83
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Leonard, H	Muskegon	1884
Leuschner, Richard		
Litchfield, E. C		1885
Little, A. F	3 .	1885
Lobdell, J. H		1884
Locher, H. E	Grand Rapids	1885
Long, B. W		1884
Long, G. L	Detroit, Mich. Ave	1885
Longwell, E. B		1884
Longwell, H. D	Paw Paw	1883
Look, J. Q		
Loomis, W. E	Portland	1884
Lonsbury, P. M	Reed City	1885
Luce, jr., W. O	Caro	1885
Lumbard, W. D	Jackson	1883
Lunn, G. D	Vestaburg	1885
Lyman, A. H	Manistee	1883
Lyons, A. B	Detroit	1884
MacKimmie, J. A	Detroit, 723 Fort St. west	1884
Madill, Thomas	East Saginaw	1884
Mahon, F. M	Oscoda	1885
Mann, Albert	Ann Árbor	1883
Mandigo, W. R	Sherwood	1884
Mason, C. A	Flint	1885
Mason, G. B		
Marr, T. W	Detroit, 333 Woodw'd Ave.	1885
Martin, A. F		
Martin C. L.	Elk Rapids	1884
Martin, Henry	Jackson	1884
Martin, Susie A		
Martyn, W. J		
Mayer, F. W		
Maynard, T. C		
Maxson, M. M.		
McCoy, W. B		
	-01	
McCrea, H. F	Detroit, Woodward Ave	1885

McDonald, D. T		1883
McDonald, George		1883
McDonald, Murdo	St. Johns	1885
McEvoy, J. E	Marristee	1885
McFarland, A	Detroit, 506 Mich. Ave	1883
McFarland, Wm	Detroit, 506 Mich. Ave	1884
McInnes, M. V		1885
McKenna, J. D		1884
McLean, C. E	Jackson	1885
McMullen, G. H	Ionia	1883
McQueen, E. F	Mt. Pleasant	1884
Mead, H. L		1884
Mead, J. N	Escanaba	1883
Merrell, F. P	Vanderbilt	1883
Merrell, M.C	Webberville	1883
Merriam, C. K		1883
Meseroll, D. C	Jackson	1884
Meyers, John		1883
Meyers, J. K		1885
Middleton, V. H		1884
Miles, J. B	Dexter	1884
Miller, C. N	Dryden	1884
Miller, H. J		1885
Millikin, T. J		
Millington, F. S		1883
Millspaugh, G. D		1883
Moore, John		1884
Moore, W. B		1884
Moorland, Charles	Hadley	1885
Morford, A. D		1884
Morrison, A. W	Constantine	1885
Morrison, Thomas		1885
Mottram, J. H. H		1883
Mueller, J. C		
Mulloy, Wm		
Murphy, J. W		
Myers, A. W		

Newell, C. P. Flushing. 1 Newman, E. P. Lansing. 1 Noble, M. L. Reed City. 1 Noel, Gideon. Palo. 1 North, S. J. Grand Rapids. 1 Northrup, B. D. North Lansing. 1 Nowell, W. S. Laingsburg. 1	
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Newman, E. P. Lansing	1884
Noble, M. L. Reed City. 1 Noel, Gideon. Palo. 1 North, S. J. Grand Rapids. 1 Northrup, B. D. North Lansing. 1 Nowell, W. S. Laingsburg. 1 Nurney, James. Au Sable. 1 O'Brien, J. R. Detroit. 1	1884
Noel, Gideon Palo 1 North, S. J Grand Rapids 1 Northrup, B. D North Lansing 1 Nowell, W. S Laingsburg 1 Nurney, James Au Sable 1 O'Brien, J. R Detroit 1	1885
North, S. J	1885
North, S. J	1884
Northrup, B. D. North Lansing. 1 Nowell, W. S. Laingsburg. 1 Nurney, James. Au Sable. 1 O'Brien, J. R. Detroit. 1	1885
Nowell, W. S. Laingsburg. 1 Nurney, James. Au Sable. 1 O'Brien, J. R. Detroit. 1	1883
Nurney, James	1884
O'Brien, J. R Detroit 1	1884
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Osborn, C. A Owosso	1885
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Padley, W. A Benton Harbor 1	1885
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Parkill, C. P Owosso 1	1883
Parkill, S. E Owosso 1	1883
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Pinkerton, R. J	Bancroft	1884
Pinckney, C. A	Plymouth	1883
Pitcher, Sheldon	Detroit, 26 Miami Ave	1884
Plaat, G. W	Grand Rapids	1885
Platts, Randolph	Port Sanilac	1884
Porter, W. B	Detroit	1884
Power, J. O	Addison	1884
Prall, D. E	East Saginaw	1883
Pratt, G. O	Detroit, 41 Marion St	1884
Pratt, Stephen		1885
Prescott, A. B		1883
Preston, George		1885
Prettie, W. H	Detroit	1885
Price, O. J		1883
Purdy, H. D	Sparta	1884
Purvis, G. A	Detroit, 983 Jeff. Ave	1885
Quick, J. B	Howard City	1883
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Raider, J. F. A	Newaygo	1883
Raider, J. F. A	Newaygo Northville	1883 1883
Randolph, A. F	Northville	1883
Raider, J. F. A	Northville West Bay City (Banks)	1883 1885
Randolph, A. F	Northville	1883 1885 1884
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Randolph, A. F Ray, G. C Reasner, F. M Reek, J. A Reed, H. T Reed, S. M Reidy, Mike Reynolds, W. B Rich, J. W Richards, F. P Richards, T. H Richardson, George Ringler, Eugene	Northville West Bay City (Banks) Jackson North Lansing White Cloud Corunna Eaton Rapids Manistee Detroit, 780 Jeff. Ave Detroit, 780 Jeff. Ave	1883 1885 1884 1884 1885 1885 1884 1883 1885 1885 1884 1885
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Ronnefeld, Theo Det		
	and Rapids	1885
	troit	1883
Roussin, V Luc		1884
	nsing	1884
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	well	1885
Ruchty, Louis Det	roit, 410 G'd River Ave.	1884
Rudolphi, Louis Do	wagiac	188 4
Rudolphi, T Dov	wagiac	1883
Rumer, J. F Rice	hfield	1885
Rushmore, W Elk	Rapids	1883
Sabin, C. E Cen		1883
Sackett, S. M Mor	aroe	1883
Safford, O. P Flin	nt	1883
Saltzer A. B Det	roit	1884
Sawyer, R. J Me	nominee	1883
<u> </u>	ney	1885
Schaefer, Wm Car	eleton	1885
Schaller, Joseph Har	wold, Dakota	1883
Schanher, Joseph Neg	gaunee	1884
Schenck, C. E		1885
	troit, 112 Mullett St	1885
•	y City	1884
Schulz, L. S St.		1885
	and Ledge	1884
	ıgatuck	1884
Scoville, G. R Ma		1884
Seed, A. WCa		1885
Seibert, G. F Iro		1883
Seibert, M. L Ma		1885
Severson, W. A Bu		1883
Share, A. L. Ev		1885
Shaw, B. B. Cla		
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Shaw S. B Ms		
Sheffield, W. E Vo	estaburg	1884
Shepherd, H. T De	etroit, J. E. Davis & Co.	1885
Sherling, F. W Gr	rand Rapids	1885
Sherlock, T. J Ot	tia	1885
Sherman, H. B M.	arshall	1885
Sherwood, C. L Do	owagiac	1884
Shook, D. L Co	oral	1884
Short, W. E M	lanistee	1884
Shotwell, R. H Le	eslie	1885
Sigler, F. A Pi	inckney	1885
Sloan, E. E Co	orunna	1885
Smith, A. B Tr	renton	1884
Smith, C. M Cla	arkston	1883
Smith, Fletcher Sa	aginaw	1883
Smith, F. D De	etroit, 303 12th St	1884
Smith, H. W Fa	armers	1884
Smith, John F Y1	psilanti	1885
Snow, H. W De	etroit, F. Stearns & Co	1885
Snow, S. M Lu		
Snyder, M. H Gr	rand Marais	1885
Sorg, H. A Ka	alamazoo	1884
Soule, C. A Ea	aton Rapids	1884
Spencer, J. L Lin	nden	1883
Spencer, M. Ella Lin	nden	1884
Sprague, O. L Fa	air Grove	1884
Sprague, W. G Flu	ushing	1883
Stanton, H. N Sh	neridan	$\boldsymbol{1885}$
Stanton, M. B Sh	neridan	1885
Stearns, Fred De	etroit	1884
Steele, Michael Ion	nia	1885
Steketee, A. G Gr	rand Rapids	1885
Steketee, G. C Gr		
Stevens, A. B De		
Stevens, C. R No		
Stevens, F. D De		
Stevenson, W. E Ho		
Stewart, M. W Ca		
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Stone, C. G
Sullivan, J. H Whitehall
Swaby, G. A West Bay City 188
Sweet, B. F Carson City
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Vaughan, B. D. Charlotte 1884 Vedder, E. H. West Bay City 1885 Vennema, H. A. Menominee 1885 Vernor, James. Detroit 1884 Vincent, J. T. Lapeer 1884 Wagar, F. G. Edmore 1885 Wagener, C. H. Big Rapids 1883 Wait, S. E. Traverse City 1884 Waite, G. W. Coldwater 1884 Wales, T. P. West Bay City 1885 Walker, W. K. Utica 1883 Wallace, A. S. St. Johns 1883 Wallace, A. S. St. Johns 1883 Walhausen, G. L. F. von Bay City 1885 Walthausen, Werner von Bay City 1884 Warles, Grafton Detroit 1884 Warner, W. A. Detroit, T. H. H. & Sons 1884 Wasson, J. B. Coopersville 1883 Watz, H. G. Saginaw 1884 Watts, Isaac Grand Rapids 1883 Watz, H			
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Whipple, G. N Detroit, 222 Orleans St 1885			
	Whipple, G. N	Detroit, 222 Orleans St	1885
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White, L. T	Eaton Rapids	1883
White, W. L		
Whitton, R. L		
Wicker, C. D	Coldwater	1883
Wiede, Henry		
Wiesinger, J. G	Detroit	1884
Wiggins, A. H	Lawrence	1884
Wilders, A. J	Ortonville	1885
Wilkins, F. C	Union City	1885
Wilkinson, J. L	Bay City	1884
Willard, H. W	Manistee	1885
Willard, Thomas	Bear Lake	1885
Williams, H. M	Mason	1885
Williams, W. C	Detroit	1884
Williamson, G. E	Vassar	1885
Williamson John	Detroit, 81 Woodw'd Ave.	1884
Wilson, A. H	Grand Rapids	1884
Wilson, G. A	Charlevoix	1884
Wilson, L. S	St. Joseph	1883
Wilson, W. A	St. Johns	1884
Wilson, W. B	Muskegon	1883
Wilson, W. E	Grand Ledge	1884
Withe, A. F	Pontiac	1884
Witherspoon, G. A	Chatham, Ontario	1885
Witherspoon, P. E	Harrison	1885
Wolf, J. G	Hillsdale	1883
Wolfinger, C. E	Hopkins Station	1884
Wood, J. E	Charlevoix	1884
Woods, T. T	Belleville	1885
Woodward, M. G	Lake City	1884
Woolsey, F. F	Hartford	1884
Wrampelmeier, T. J		
Wright, Chas	Detroit	1883
Wright, C. A		
Wright, E. A	Pentwater	1885
Wurzhurg F J		

Yeomans, E. T	Ionia	1883
Young, C. A		
Young, E. A		



HONORARY MEMBERS.

Englehard, G. P	Chicago, Ill	1883
Garrigues, S. S		
Le Caron, H	Braidwood, Ill	1883

DECEASED MEMBERS.

	Elected.	Lied.
Escott, E. BGrand Rapids,	18 84	1885
Parsons, H. BNew York		1885
Riebe, CarlAnn Arbor		1885

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MEDICATED FLUID EXTRACTS

Prepared by a NEW and SUPERIOR Process.

The physician and dispenser will invariably find our Extracts UNIFORM, and of FULL STANDARD STRENGTH, viz: Each cubic-centimeter of Fluid Extract, representing the soluble constituents of one gram of drug, of the best quality obtainable. This standard is invariably adhered to by us, unless otherwise specified by proper authority. We exercise the most sorupulous care in every detail of manufacture, and in the selection of the materials used, purchasing only fresh drugs, of proper collection and preservation, and grinding same ourselves; so that it is impossible for any drug of an inferior quality to be used in their manufacture. their manufacture

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Quinine may be given advantageously with it. Pleasant to the taste. Palatable, and better than the Officinal, or Syrup Dover's Powder.

The Bromides of Ammonium, Camphor, P tassium and Sodium, present in Doverina (taking the place of the inert Potassium Sulphate of the officinal Dover's Powders), enhance and Boergias the Sedativ's and Hypnotic Action of the Opium, at the same time controlling its unpleasant effects. (See Bartholow's Therapeutics). The Op um used in its manufacture is the best pure Turkey Gum, deprived of most of its nauscating properties.

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tion; 3d.—The depressing effect of the potassic bromide is lessened.

The ELIXIR OF DOVERINA presents us with OPIUM in its most palatable and agreeable form, and is Miscible with all ordinary fluids. An excellent sudorific; palatable ano-

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As an adjuvant to any Cough Mixture, the ELIXIR of DOVERINA is to be preferred to Laudanum, Paregoric, Chloral, Morphine or Hydrocyanic Acid. In Fevers this preparation is far more palatable than the Officinal Dover's Powder.

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Bear in mind: We shall always serve your interests with as low prices as quality of goods will admit, aiming to treat our customers as we like to be treated ourselves. In other words we are looking for permanent customers.

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JAMES E. DAVIS & CO.

WHOLESALE DRUGGISTS, Detroit, Mich.

MICHIGAN STATE



ASSOCIATION.

PROCEEDIAS, 1886.



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Send for priced catalogue and formula book and for quotations on pills in bulk, in convenient form for retailing, or for special formulæ in any desired

quantity.

PARKE, DAVIS & CO.

Manufacturing Chemists,

NEW YORK (50 MAIDEN LANE AND A STREET.

DETROIT, MICH.

25/69.

PROCEEDINGS

OF THE

MICHIGAN STATE

Pharmaceutical Association,

AT ITS

FOURTH ANNUAL MEETING

HELD IN

THE CITY OF GRAND RAPIDS.

October 12, 13 and 14, 1886.

ALSO THE

CONSTITUTION AND BY-LAWS, ROLL OF MEMBERS, ETC.

DETROIT:
D. O. HAYNES & COMPANY,
1886.

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STANLEY E. PARKILL, Secretary,
Owosso, Mich.

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	នរ	ECRI	CTAR	ies.			
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1886-87.

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WM. L. WHITE, -	-	-		- Grand Rapids.
JACOB JESSON, -	-	-	-	- Muskegon.

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Newaygo	.J. F. A. Raider	. Newaygo.
Oakland	.W. D. Harshaw	. Pontiac.
_	.J. L. Strong	
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Ottawa	F. A. Hutty	. Grand Haven.
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Shiawassee	.W. H. Bigelow	. Owosso,
Traverse	S. E. Wait	. Traverse City.
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Washtenaw	H. J. Brown	.Ann Arbor.
Wexford	R. J. Cummer	. Cadillac.

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APPOINTED BY HIS EXCELLENCY,

GOVERNOR RUSSELL A. ALGER,

JUNE 12, 1885.

ORGANIZED AT LANSING, JULY 7, 1885.

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JACOB JESSON, -	-	-	-		-		-	Muskegon.
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JACOB	JESSON,	-	-	-	-	-	Muskegon.						

meetings.

The regular meetings of the Board are held on the first Tuesday of March, July and November. Special meetings at the call of the Board.

Members in Attendance

-AT THE-

FOURTH ANNUAL MEETING,

HELD IN GRAND RAPIDS,

October 12, 13, and 14, 1886.

A

Adams, C. H., Otsego. Akey, James V., Colon. Allen, A. W., Detroit.

Baar, Henry, Grand Haven.
Bailey, Morrison, Plainwell.
Baker, Dennis, Grand Rapids.
Baldwin, E. L., Ludington.
Bangs, W. Z., Holland.
Barrows, J. F., Lawrence.
Bassett, A., Detroit.
Bassett, J. A., Detroit.
Bauer, A. C., Grand Rapids.

Caldwell, J. W., Detroit.
Cameron, Alex., Walton
Carney, M. S., Dowagiac.
Chapple, L. D., Wayland.
Cleveland, H. W., Nunica.
Colman, G. E., Detroit.
Colwell, C. B., Jackson.
Conrad, John, Otsego.
Cooke, F. A., Detroit.

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Alsdorf, F. M., Lansing. Amberg, Isaac, Battle Creek. Anderson, E., Midland.

В

Beaman, Geo. W., East Jordan. Bird, Henry, Jr., Douglas. Bigelow, W. H., Owosso. Blackmar, H. A., Charlotte. Bæhnlein, Geo., Detroit. Botsford, E. S., Dorr. Brown, D. D., Kalamazoo. Brown, H. J., Ann Arbor.

C

Crane, Geo. W., Cheboygan.
Crispe, John, Plainwell.
Crookston, J. A., Grand Rapids.
Cross, F. E., Grand Rapids.
Crouter, G. W., Charlevoix.
Curran, E. S., St. Joseph.
Cushman, H. D., Three Rivers.
Cutler, W. R., 10nia.

D

Davie, R. P., Flushing. Dunham, E. M., Grand Rapids. Davis, Jas. E., Detroit. Dunlop, John W., Clare. Dickinson, O. B., Grand Rapids. Dupont, Wm., Detroit. Dodge, E. L., Montague.

E

Eberbach, O., Ann Arbor. Eckerman, A., Muskegon. Escott, F. H., Grand Rapids.

F

Fairchild, H. B., Grand Rapids. Foote, C. E., Jackson. Farnham, E., Casnovia. Fasquelle, L. J., Detroit. Federer, E. C., Detroit. Fincher, F. W., Pentwater.

Fordham, M., Elmira. Fordham, W. W., Traverse City. Fox, J. R., Cedar Springs. Francis, J. L., Ypsilanti.

G

Gladding, B. O., Constantine. Griffith, W. F., Howell.

Gundrum, Geo., Ionia.

Н

Haight, A. L., Woodland. Hale, H. G., Nashville. Hanlon, A., Middleville. Harrison, D. A., Detroit. Harvey, H. D., Bangor. Harwood, G. M., Petoskey. Harwood, Henry, Ishpeming. Hastings, R. A., Sparta. Hazeltine, A. F., Grand Rapids. Hynes, Quincy A., Hastings.

Heath, Fred., Hastings. Hibbard, F., Evart. Hinchman, C. C., Detroit. Hogeboom, J. G., Saginaw. Hotchkiss, F., Hastings. Hower, Nelson, Mendon. Hunt, F. J., Detroit. Hutty, F. A., Grand Haven.

I

Inglis, Frank, Detroit.

J

Jesson, Jacob, Muskegon.

Johnson, J. G., Traverse City.

K

Kellogg, A. F., Cedar Lake. Kemink, Theo., Grand Rapids. Kimm, D., Grand Rapids.

Kimm, M. B., Grand Rapids. Klingman, T., Dexter.

L

Lambert, B. L., Detroit. Laubengayer, T. A., Owosso. Locher, H. E., Grand Rapids. Lonsbury, J. H., Reed City.

Lunn, G. D., Vestaburg. Lyman, A. H., Manistee. Lyons, A. B., Detroit.

M

Madill, Thos., Detroit. Mandigo, W. R., Sherwood. Martin, C. L., Elk Rapids. Martin, Susie E., Pierson. Martin, Henry, Jackson. McDonald, D., Kalamazoo. McDonald, Geo., Kalamazoo. McHenry, G. A., Chippewa Lake.

McNeal, Byron, Byron Centre. Mesick, H. J., Plainwell. Mandigo, Mrs. W. R., Sherwood. Middleton, V. H., Grand Rapids. Miller, N. N., Fremont. Mills, L. M., Grand Rapids. Milner, C. H., Big Rapids. Mottram, J. H. H., Detroit. Muir, John D., Grand Rapids.

N

Norris, J. S., Casnovia.

North, S. J., Grand Rapids.

0

Owen, W. H., Maple Rapids.

P

Paige, L. E., Sparta. Parkill, S. E., Owosso. Parkinson, E. A., Traverse City. Phillips, E. F., Armada. Passage, J. H., Greenville. Peck, A. W., Walton. Peck, J. E., Grand Rapids. Pegg, H. D., Morenci.

Perrigo, L., Burnip's Corners. Perry, F. W. R., Detroit. Prescott, A. B., Ann Arbor. Preston, T. W., Millbrook. Price, O. J., Detroit. Purdy, H. D., Fennville.

Raider, J. F. A., Newaygo. Reidy, Mike, Corunna. Ripley, L. G., Montague.

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Safford, O. P., Flint. Schlieper, F. A., Bay City. Schumaker, A. B., G'd Ledge. Shireling, F. W., G'd Rapids. Sheffield, W. E., Vestaburg. Shook, D. L., Coral. Smith, C. M., Clarkston. Snow, H. W., Detroit. Snow, S. M., Ludington.

Taylor, C. W., Loomis. Tibbs, W. H., Grand Rapids.

Todd, F. J., Detroit.

Vernor, James, Detroit. Van Der Veen, J., G'd Haven. Van Leeuven, W. H., G'd Rapids.

Wagner, Adam, Eastmansville. Wilkins, F. C., Union City. Walker, W. K., Lansing. Warner, W. A., Detroit. Watts, Isaac, Grand Rapids. Watson, J. B., Coopersville. Webb, R. S., Alma. Webb, E. T., Jackson.

Webber, A. H., Big Rapids. Wells, Frank, Lansing. White, W. E., Grand Rapids. White, W. L., Grand Rapids.

R

Roche, W. J., Lake City. Rodgers, E. J., Port Huron.

S

Spayde, W. H., Bloomingdale. Steketee, A. G., Grand Rapids. Steketee, G. G., Grand Rapids. Steketee, J. G., Grand Rapids. Stevens, A. B., Ann Arbor. Stevenson, A. W., Muskegon. Stone, C. G., Detroit. Stover, H. E., Kalkaska. Sweet, B. F., Carson City.

T

Trobridge, T., Decatur. Tubbs, C. C., Chesaning. Tweedale, J. R., Muskegon.

W

Wilson, A. H., Grand Rapids. Wilson, M. V., Sand Lake.

Wolfe, J. G., Hillsdale. Wood, J. E., Charlevoix. Woolford, R. S., Mecosta. Woolsey, F. F., Hartford.

Wright, Chas., Detroit. Wright, E. A., Pentwater.

Wurzburg, F. J., Grand Rapids.

Proposed Amendments to the Constitution.

ARTICLE IV.

To insert after the words, "elected at the," these words;
"Third sitting of the."

The section as amended would read as follows:

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer and an Executive Committee of five members, all of whom shall be elected at the *third sitting of the* regular annual meeting of the Association by ballot, and to serve until their successors are elected.

ARTICLE V. SECTION L

To insert after the word "members," these words:

"Fill all vacancies that may occur in the offices of the Association between the annual meetings."

Section as amended would read as follows:

Section 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, until the close of such meeting, call special meetings at the written request of twenty-five members, fill all vacancies that may occur in the offices of the Association between the annual meetings, shall present at each meeting a report of the Association and perform such other duties as pertain to the office.

MINUTES

OF THE

FOURTH ANNUAL MEETING

OF THE

Michigan State Pharmaceutical Association.

FIRST SESSION,

Tuesday Afternoon, October 12, 1886.

The Association met in the Royal Arcanum Hall, Grand Rapids, at 2 o'clock P. M., and was called to order by the President, H. J. Brown, of Ann Arbor, who said:

LADIES AND GENTLEMEN: The hour has arrived for the opening of the fourth annual meeting of the Michigan State Pharmaceutical Association. It will be needless for me to endeavor to express the great satisfaction and pleasure I feel in welcom. ing so many of you who were at our first session. It has been thought by some that owing to the change of our place of meeting, from Detroit to Grand Rapids, and the fact that the Association had accomplished one of its greatest works, namely, the enactment of the pharmacy law, this meeting might not be so well attended as the previous ones, and that the interest in the Association might begin to wane; but, it seems from the number present at this session, that these fears were entirely ground-If the attendance which we are likely to have here is one of the indications of the waning interest in the Association, I can only say I hope it will continue to wane in the same way. anticipations of pleasure and profit that you may have felt in looking forward to this meeting, I hope, will be more than realized, and that we shall work together harmoniously for the

best interests of the Association. Let us put aside all selfish interests and work for the good of the whole body and for the profession of pharmacy throughout the State. Let us prove all things, and hold fast those which are good.

The President then introduced the Rev. F. A. DeRossett, who offered an opening prayer.

THE PRESIDENT—The next order of business is calling of the roll of members of the Association.

Mr. Wells—Mr. President, I move that the calling of the roll of the 688 members of the State Pharmaceutical Association be dispensed with; it will occupy too much time.

Carried.

THE PRESIDENT—The next thing in order is the address of welcome. In the absence of his Honor, Mayor Dykeman, John W. Hayward, President of the Common Council of the City of Grand Rapids, has kindly consented to welcome the Association.

ADDRESS OF WELCOME BY MR. JOHN W. HAYWARD OF GRAND RAPIDS.

Mr. President, and Ladies and Gentlemen of the Michigan STATE PHARMACEUTICAL ASSOCIATION,—We always take great pleasure and pride in welcoming business people to Grand Rapids. necessary for me to say we are very proud of our city. I will say further, I feel it devolves upon me, in this welcome business, to call attention to a few things you will find here. You will find here, I believe. anything you are looking for, from a bottle of "Carter's Little Liver Pills" to a barrel of Bourbon; from a medicine dropper to a cask of Cod Liver Oil. I will simply call the attention of the people who are herethe gentlemen without their wives, and their mothers and sisters—to the fact that the druggists of Grand Rapids are a very modest and reflecting class of people; they do not care to have their morals corrupted by any counter-jumpers from the little town of Detroit. After the reception this evening we will leave you to judge as to our hospitality, but at the same time. I warn you not to parade yourselves too much-not to be caught marching with the Salvation Army.

RESPONSE, BY A. BASSETT, OF DETROIT.

Mr. President, Mr. Hayward, and Ladies and Gentlemen—I have just arrived in your beautiful city, but I learned as soon as I reached here that you are after the scalp of a Bassett; I don't know whether it is safe for me to say anything here or not. We are very much pleased to

meet in your beautiful city for the purpose of conducting the business in connection with this Association. Not a little of our pleasure is in knowing that a hearty welcome awaits us. We come up here feeling that the people of this city are in sympathy with us in this movement, and are ready to hold us up in what we are attempting to do for pharmacy in the State of Michigan. It needs not the words of welcome from the President of your Common Council to assure us of that; we all have the assurance in the programmes of the Association which are scattered broadcast over this city, giving us an idea of what you intend to do. Your representative, Mr. Hayward, has thrown out some insinuations with regard to what we might do with the people of your city. Now, Mr. President of your Council, we are a lot of pill makers, but we wish to assure you that we are no pills. We are gathered here from the smaller places of the State, like Detroit, Saginaw, Port Huron, and Muskegon, and other lumber and salt towns, for the purpose of exchanging ideas, for the purpose of teaching each other what we have learned ourselves, and we hope to be successful in imparting new ideas. The profession of pharmacy is a progressive one; we have, in the last few years, cased castor oil in capsules instead of giving it in nauseating doses covered with essence of pepperment, etc.; we have put your pills in sugar coat, and gelatine coat, and put up quinine elixirs in such a shape as to be almost tasteless. We hope to go still further, we hope to be able, before many years shall pass, to give medicine in your daily food so that you will not know you are taking it. We expect great things from this meeting here. We know we are to be right royally entertained. We feel it will be good for us to be here; it will be good for us to have met here, and we hope, also, it will be good for this beautiful second city of our great State to have had us here,

Mr. John W. Harward—After the declaration of the object of this meeting I give you a hearty welcome, and, in the name of the citizens of Grand Rapids, grant you the freedom of the city.

THE PRESIDENT—The next order is the reading of the minutes of the last meeting by the Secretary.

Mr. Wells—The reading of the minutes involves the reading of the contents of the book I hold here. I make a motion similar to the one I made a short time ago, that the reading of the minutes be dispensed with.

Carried.

PRESIDENT'S ADDRESS.

Mr. Wurzburg having been called to the chair, the president delivered his annual address, as follows:

FELLOW MEMBERS OF THE MICHIGAN STATE PHARMACEUTICAL Association—As me meet here to-day, after a year's separation since the

adjournment of our third annual meeting, it becomes my duty, and pleasure as well, to extend a most cordial greeting to each and every member, and to express the hope that the year has been a prosperous and profitable one in every way. In the profession of which we are members there can be no dormant existence. In these days of sharp competition, when all men, and not a few women, seem possessed with (I had almost said an insane) desire to become rich in a few short years, and when the growth and rapid development of new ideas and improved methods of work in every branch of industry seems to urge us on to greater and ever increasing activity, it is impossible for us to stand still. We must advance or retreat. We must wage an aggressive warfare on ignorance. incompetency, and dishonesty, and on every form of fraud and quackery. We must keep fully abreast of the latest thought and most progressive ideas of the day, or we must fall behind. Each one must realize that he has made some advancement in the year that has passed, or he must confess that he has lost ground.

The year has been one of marked improvement in many things that pertain to our calling. It would be imposing on your good nature, and a waste of valuable time, for me to attempt, at this time, to give even a brief review of the improvements that have been made in the modes of preparing and dispensing pharmaceutical preparations and chemical products; of the new remedies discovered, and the new uses to which older ones have been successfully applied. I realize that I am addressing a body of intelligent and active pharmacists, a great majority of whom have kept well informed of all the changes that have occurred. In this connection I am led naturally to refer to the subject of the small number of Michigan pharmacists who are members of the American Pharmaceutical Association. I am very sure that if you knew the benefit to be derived from a membership in that body, many more would join it; and as its next meeting is to be held quite near us, at Cincinnati, next September, I hope to see a largely increased membership from this State. Of the three thousand pharmacists in this State only thirty are members of this Association. Although you may not be able to attend its meetings you will find the annual reports of great value. The report on the Progress of Pharmacy, prepared by that indefatigable worker, Prof. C. Lewis Diehl, is alone worth the amount of the yearly contribution required. In it one gets, in condensed form, nearly all that is really valuable of the great mass of matter given us yearly in the various pharmaceutical journals.

THE CONDITION OF THE ASSOCIATION.

Among the duties which Article V of the Constitution requires of your President, is that of presenting a report of the condition of the Association. This will be shown, fully and satisfactorily, by the reports of our Executive Committee, of our Secretary and Treasurer, and I shall therefore confine myself to a report of the few official acts which I have per-

formed, and to a few recommendations bearing upon the welfare of the Association.

First, it seems to me that there should be a change, in one particular, in the manner of conducting the affairs of the Association. Under the present arrangement the President is required (Art. V, Sec. 3 of the Constitution) to countersign all orders drawn upon the Treasurer by the Secretary. To this there would be no objection were it not for the fact that the President or Treasurer has no means of knowing whether the orders are for duly audited bills or not. It is not probable that any serious harm will ever come to the Association under this arrangement, unless we should be so unfortunate as to have a dishonest Secretary. It would be easy for such an one to bankrupt the Association's treasury in short order. I recommend, therefore, that the Constitution be so amended as to cover this defect. Perhaps the easiest way to accomplish it would be to make the President and Treasurer members of the Executive Committee. Then the bills would have to pass through their hands and they would thus be able to know whether the orders as drawn are correct.

Another change or addition which it seems to me ought to be made in or to our Constitution is one whereby the President would be authorized to fill any vacancies that may occur during the year in any list of delegates or in the membership of any committee. I have felt the need of such authority or privilege several times. I think we might have been better represented at some of our neighboring State Association meetings, and at the American Pharmaceutical Association, and National Retail Druggists' Association if I had felt that I had the right, and that it was my duty to fill the vacancies that occurred.

I now venture to suggest for your consideration a subject which it seems to me may become a very important one in the near future, viz: the relations that should exist between the members of our profession on the one hand, and of the medical profession on the other. Whether this Association can take any action looking toward, and tending to bring about, a more cordial and intimate relation between these two, is a question which would seem well worth our consideration. The interests of the two callings are so closely allied that there ought to be a more-generous appreciation and recognition, by the physicians, of the pharmacists' rightful position, and a more just and considerate treatment of physicians on the part of pharmacists, than is now practiced in many places. I earnestly believe that the inauguration of such a course on our part will lead eventually to the most pleasant and profitable results, and inure to the benefit of the general public. Would it not then be expedient for us to take the initiative in such a movement by requesting the State Medical Society to appoint or elect several delegates, at their meeting next June. to attend our next meeting? To such delegates, I think, this Association would gladly accord the privileges of the floor in our discussions and debates. I commend the subject to your careful consideration.

Expressly disclaiming, now, any thought of criticising our most faithful Secretary, I must say that I think it very important that our proceedings should be gotten out more promptly. Interest in the appearance of the volume has greatly diminished by the time it is issued. I know our Secretary did the best he could, and I refer to the matter mainly that I may take occasion to suggest and recommend that some way be devised to relieve him of part of the work. It is more than any one man ought to be expected to do who has any other business. We must, I think, appoint a Publication Committee, or elect an Assistant Secretary, whose special duty it shall be to see that the proceedings are promptly issued. And right here I must express the hope that future editions will not be marred with advertisements. It would seem that an Association of the size of this ought to be able to do away entirely with advertisements in its printed proceedings. They are a blemish at best. And I notice that several of the other State Associations have no advertisements in their proceedings; and while I am not willing to admit that any other volume of proceedings which I have seen equals ours, in the number and valuable character of its papers and reports, I am forced to acknowledge that some do surpass us in make-up and beautiful appearance, especially that of the New York State Association.

Our Secretary has called my attention to the fact that the By-Law requiring members to sign the Constitution ought to be amended. It is impracticable, and therefore inoperative. The difficulty has been effectually overcome this year, so far as our new members are concerned, by having inserted in the blank application a clause by which the applicant authorizes the Secretary to sign the Constitution for him. Perhaps it would be the easiest way to amend the law by making it conform to this idea.

With some fear lest a chorus of "chestnut bells" should sound upon my ear, I take occasion to urge upon you the formation of local societies. I cannot present this with the force that I think the subject demands, because of a consciousness of having been derelict in this matter myself; but I hear such good reports from the various local societies in the State that I feel assured that it would be a wise plan for them to be formed wherever practicable; and in some instances I think the formation of County Associations would be very beneficial. The plan has been successfully tried in other States and I can see no reason why it should not succeed in Michigan.

I have been requested to call your attention to the matter of free samples of "patent" nostrums. It is said to damage the sale of the larger or regular sizes. The Grand Rapids and Saginaw societies have taken a stand against this alleged nuisance, and have driven the free samples out of their respective cities. I doubt whether this is a question with which this Association cares to deal, but I have done my duty by laying the matter before you, and I leave it for you to take action or not, without

any recommendation from me. To me it seems an open question whether it would not prove a blessing to our calling if free samples, or something else, should not only damage, but ruin the sales of this class of preparations entirely.

Doubtless you are all aware of the injury to nearly every retail druggist in the State that is brought about by the publication in the Detroit daily papers, of the jobbing prices of quinine, morphine and other staple articles in the drug line. Such quotations are of no special benefit to anyone. If they are furnished to the press by the Detroit jobbers I think this Association ought to request said jobbers not to furnish them in the future, and I have no doubt they would gladly respect such request. If you want to know the market on hops, beeswax, oil of peppermint, or any other article which a retailer occasionally desires to purchase of the producer, you will look in vain in these same papers for quotations.

Since the meeting of the American Pharmaceutical Association I have received the following circulars, which are self explanatory:

INFORMAL CONFERENCE OF STATE SECRETARIES.

Providence, R. I., September 8, 1886.

In accordance with a suggestion made by Secretary Holmes, of the New York State Association, all State Secretaries attending the meeting of the American Pharmaceutical Association were invited to hold an informal conference at the Narragansett House for the purpose of mutual acquaintance, and a discussion of many matters of interest.

Such a conference was held at 2 P. M. September 8th. The conference

was called to order by Secretary VanSant, of New Jersey.

On motion of Secretary Holmes, Dr. Rosa M. Upson, Secretary of the

Iowa Association, was made Chairman.

The following persons were present: Secretary P. C. Candidus, Alabama; Secretary Fred. Wilcox, Connecticut; Secretary Dr. Rosa M. Upson, Iowa; Secretary J. W. Colcord, Massachussetts; Secretary R. H. VanSant, New Jersey; Secretary Clay W. Holmes, New York, and Secretary James C. Munds, North Carolina.

Mutual greetings were exchanged.

The subject of a yearly conference of State Secretaries in connection with the meeting of the American Pharmaceutical Association, or National Retail Druggists' Association, for the purpose of discussing the best ways and means for conducting the business of State meetings and considering the condition of matters in the various States, with a view to a more general understanding of the affairs of each State in its relation to the general welfare of the whole, was presented and freely argued. It was the opinion of all that such a meeting would be of much benefit to the Secretaries individually, in better fitting them to perform the duties of their offices, and to the Associations by directing the workings of each toward the accomplishment of the same or similar ends. It was suggested that the personal acquaintance of the officers of the various Associations would render their work much more pleasant and successful.

Secretary VanSant, of New Jersey, offered the following resolution,

which was carried:

Resolved. That a committee of three, consisting of Secretaries Holmes. Colcord, and Upson be appointed to confer with the Secretaries now present as to the desirability of such a departure, and also to present the proposed plan to the Presidents of all State Associations, soliciting their opinion and co-operation.

It was suggested that owing to the benefit which would accrue to the Associations from such conference, the actual traveling expenses of the Secretaries should be paid from the State Association treasuries.

After a pleasant chat on general work, as performed by the different Secretaries, and the evolution of ideas beneficial to all, the informal conference was adjourned.

DR. ROSA MARTIN UPSON, Chairman.

ELMIRA, N. Y., October 1, 1886.

Mr. H. J. Brown, President Michigan State Pharmaceutical Association;

DEAR SIR-In accordance with the resolution adopted at the informal conference, a report of which is herewith submitted, we present our respects, and trust you may regard the subject favorably and present it officially to your Association at its next meeting, in your annual address, together with your recommendation that favorable action be taken there-The subject was fully discussed at this meeting, and also thoroughly ventilated among the members of the American Pharmaceutical Association, who represented many of the States, and included a number of Presidents of State Associations. All seemed to grasp the idea, and approved it heartily, as one peculiarly conducive to the best interests of State Associations, and calculated to promote harmony among the States and the general condition of trade interests everywhere. Will you kindly communicate to the Chairman of the Committee your individual views at an early day, that opportunity may be given the Committee to further enlighten you, should any points seem obscure. In case of favorable consideration and action by your State Association, official notice should be given the Chairman, and a conference will be held in Cincinnati in Respectfully submitted, September, 1887.

CLAY W. HOLMES, Chairman, J. W. COLCORD, DR. ROSA M. UPSON.

Committee.

In accordance with the request of the last circular I replied to it, and expressed my individual views in regard to the matter. The idea seems to me to be a good one, and I hope, therefore, that the Association will take the subject into consideration, and that a favorable action will be the result. Surely it will be money wisely expended to pay the traveling expenses of our Secretary to such a conference, if it will in any way help to make his work more easily and efficiently performed.

I have also received the following circular from Messrs. Powers & Weightman:

Philadelphia, December 15, 1885.

DEAR SIR—You are probably aware that the Legislatures of Florida and Georgia have enacted laws regulating the manner in which packages containing Sulphate and other preparations of Morphia shall be wrapped, etc., when sold in their respective States.

In Florida the bottles must be wrapped in scarlet paper.
In Georgia a SCARLET LABEL, with WHITE LETTERS, is required, as well as a scarlet wrapper.

The Georgia law is as follows:

"An Act to prescribe the manner of selling the Sulphate and other preparations of Morphine in this State, and for other purposes:

"SECTION I. Be it enacted by the General Assembly of the State of Georgia, That on and after the first day of January, eighteen hundred and eighty-six, it shall not be lawful for any druggist or other dealer in drugs and medicines to sell or offer for sale any Sulphate or other preparations of Morphine, in any bottle, vial, envelope, or other package, unless same shall be wrapped in a SCARLET paper or envelope, and all bottles or vials used for the above purpose shall have in addition to said SCARLET wrapper, a SCARLET label, lettered in WHITE letters, plainly naming the contents of said bottle.

"SEC. II. Be it further enacted by the authority aforesaid, That any one violating the provisions of the above section shall be guilty of a misdemeanor, and, on conviction thereof, shall be fined not less than ten, nor more than fifty dollars, at the discretion of the court, for each and every

violation of the preceding section.

"Be it further enacted, That all laws and parts of laws in conflict with this Act, be, and the same are hereby repealed." [Approved Octo-

ber 13, 1885.

Recent mistakes, in some cases attended by most distressing circumstances, and followed even by loss of life, have drawn the attention of druggists and the general public to the necessity of additional safeguards in handling Morphia preparations.

The subject has been discussed by Pharmaceutical Associations in convention; by the public press, as well as by journals and newspapers specially devoted to drug interests; and, as has already been stated, action

has been taken by the Legislatures of two States.

It is more than probable that other States will enact laws of similar character to those now in force in Florida and Georgia, and it will be of very great importance to dealers, as well as to manufacturers, to have laws harmonizing as closely as possible.

Should one State require a scarlet label with white letters, another a black label with white letters, another a green label, etc., the greatest confusion would result. Manufacturers and dealers alike would be quite unable to regulate their supplies so as to meet, with promptness, requirements so conflicting in character, while consumers would be utterly at a loss to understand why an article heretofore presenting a uniform appearance, should be offered in various styles, and differing so greatly from what they have been accustomed to receive.

Hence we think it would be well to have brought to the attention of your State Pharmaceutical Association, or such other organization as you may deem proper, the advisability of adopting a label similar to that required in Georgia—a scarlet label with white letters—a sample of which,

as now used by us for the trade in Georgia, we show herewith.



Such a recommendation, addressed to the Legislature of your State by so well advised a body as your State Pharmaceutical Association, would doubtless be adopted.

Commending this matter to your consideration, we remain, Very respectfully, your friends,

POWERS & WEIGHTMAN.

Any means that will aid in preventing the numerous errors which occur from time to time in dispensing and administering this most valuable but greatly abused drug, will be hailed with a great sense of relief and satisfaction by both the pharmaceutical and medical professions. I am aware that there is not perfect unanimity of opinion in regard to this subject. It has been said, and there is some force in the argument, that if red is generally adopted as the color for all labels and wrappers for poisonous articles, it will lead people to the conclusion (which is not altogether illogical) that a label of any other color is a sure indication that the contents of the package are not poisonous, and thus as many errors will occur as under the present system. A leading pharmacist of Illinois characterizes it as the "red label craze." It seems to me, howeyer, that many more reasons can be given why such a distinctive label should be used, not only for Morphine, but for all poisonous articles, than can possibly be adduced against such a custom. And I am glad to see that the committee appointed at our last meeting to report upon Mr. Dunn's paper on antidotes for poisons, expresses the opinion that "in general the practice of distinguishing all poisonous articles with red labels is to be encouraged," and that "if it were generally done its significance would soon become universally understood." I recommend that the Association instruct its Committee on Legislation to bring the matter before the next Legislature, and endeavor to have a law enacted similar to that of Georgia. In my judgment, it would be a move in advance if the committee should be asked to take the whole subject of legislation bearing on the sale and registration of poisons into consideration, and endeavor to have the present law repealed by the enactment of a simpler and better one, one with which an ordinarily busy pharmacist might reasonably be expected to comply. It is an "open secret" that the present law is a dead letter. Labels for Morphine ought certainly to bear the word poison plainly printed upon them, and the names of the proper antidotes. I cannot understand why it is that during all these years Morphine has been sent out by the manufacturers, and usually sold by the dealers, without a poison label being attached, especially as it has so often, and with such terrible results, been mistaken for Quinine.

Some weeks since our local Secretary wrote me that he was receiving numerous applications from proprietors of patent medicines for space in the exhibit rooms. He also stated that manufacturers of pharmaceutical preparations objected to being placed side by side with "patents," and further that it was the opinion of the local pharmacists that a line should be drawn excluding the objectionable goods. He asked my opinion, and

raised the question whether the Association would sanction such action. I replied that I favored excluding that class of goods, and believed that a large majority of the Association would endorse such a course; and I recommended that in the future the exhibits be restricted to articles of a pharmaceutical nature. I fancy that it is not the desire of this body to have the exhibits at its annual meetings turned into a fair, by the display of liquors, cigars, and fancy goods generally, but that it should be made more nearly a strictly scientific exhibition.

Two years ago President Wells recommended the adoption of a code of ethics. His recommendation was favorably reported by the Committee on the address, adopted by the Association, and a committee was appointed to prepare a code, but they have never reported one. Connecticut has a code, and the President of the Massachussetts Association, at their last meeting, recommended the adoption of a similar one there. And while I am not prepared to advocate very strongly the adoption of a code by this Association, there are some such good points in this Connecticut code that I have decided to incorporate it in this address, in order that you may have more definite ideas about the matter. It is as follows:

First. We accept the United States Pharmacopæia as our standard and guide for all officinal preparations, and recognize a variance from its rules only in exceptional cases, when sufficient authority has proved some other process more liable to attain the end. We would, however, recognize the authority to dispense medicines when they are especially ordered to be compounded in accordance with foreign pharmacopæias.

Second. We discountenance all secret formulas between physicians and pharmacists, and consider it our duty to communicate such to each other when requested, unless otherwise directed by the physician who originated the same.

Third. We distinctly repudiate the practice of allowing physicians a percentage in any form on their prescriptions or patronage as being derogatory to both professions.

Fourth. We will endeavor as far as possible to refrain from compromising the professional reputation of any physician, and expect in return the same courtesy from him.

Fifth. Believing that the professional training of a pharmacist does not include those branches which enable the physician to diagnose and treat disease, we should in all practical cases decline to give medical advice and refer the applicant to an educated physician.

Sixth. The growing demands of the age require that those who follow the profession of pharmacy should be educated up to a higher standard; therefore, we consider it our duty to encourage the advancement of knowledge in our profession generally, and more particularly by stimulating our assistants in every way possible to become proficient in their business.

Seventh. While we recognize the value of alcohol as a therapeutic agent, and believe it proper to be dispensed or sold as such by pharmacists, we would deplore the wide-spread evils resulting from its intemperate use, and we condemn any attempt to make it a prominent feature of our business, or its sale in any form to be drunk on our premises, as unprofessional and contrary to public policy and good morals.

Eighth. Believing that some means should be adopted to enforce the provisions of this code, a member may report, at any annual meeting of this Association, any member whom he finds violating the same, at which time the accused may be heard in his own defense, and if the member accused should be found guilty he may be expelled by a vote of two-thirds present.

Could I be assured that the requirements of such a code as this would be complied with I would most earnestly recommend its adoption.

As this Association is supposed to be conducted on sound financial principles, I suggest that it would be well for the Committee on Entertainment not to furnish tickets to any who are in arrears for dues, and I would recommend in this connection that in future this Association pay for its own entertainment.

I suppose that most of you are aware that the American Pharmaceutical Association, at its last meeting, was practically reorganized, and (I quote from the last number of the Druggists' Circular) "now recognizes the necessity of devoting some attention to each and every interest which is common to pharmacists throughout the country, and also that one Association can serve these interests better than two. Therefore the National Retail Druggists' Association is already practically merged in the American Pharmaceutical Association, although it will preserve its separate existance for the coming year, in order that it may be able to act upon whatever questions may arise meantime to demand action, and also that it may see proof at the Cincinnati meeting of the professions of good faith on the part of the older organization."

The American Pharmaceutical Association adopted the following resolution:

Resolved, That this Association solicit the aid and co-operation of the American Medical Association in promoting the prescribing by physicians of officinal medicines only, or of such preparations as have published formulas in preference to others, and that the several State Phatmaceutical Associations make similar requests of their respective State Medical Associations.

I recommend that we take action to conform to the requirements of this resolution. Another resolution was adopted relating to the unofficinal formulary as follows.

Resolved, That in addition to the five members from New York and Brooklyn, there shall be appointed one person from each State Pharmaceutical Association, all of whom shall constitute the Committee on

Unofficinal Formulæ, and that five members thereof shall be a quorum for the transaction of business.

In accordance with this resolution the President of the American Pharmaceutical Association has asked me to nominate one of the most efficient members of our Association as one of this committee. After some consultation I decided to nominate Mr. A. B. Stevens, which I trust will meet with your approval.

I notice that the Wisconsin Association, at its late meeting, appointed its representatives to serve on the committee for the revision of the United States Pharmacopæia. As this committee will have very important work to perform, requiring much time and study, perhaps it would be well for us to follow the example of Wisconsin in this matter.

I wish to renew the recommendation that has been made by my predecessors, namely: that a committee be appointed to secure the incorporation of this Association at the next session of the Legislature.

In conclusion, my friends, I wish to acknowledge, so far as it is possible for me to do so in words, my grateful appreciation of the honor you have conferred upon me in electing me to the highest office within your gift. The remembrance of this distinction will ever be a most pleasant one. I hope that the interest which I have ever felt, and shall continue to take in the affairs of this, the leading Association of the country, will be evidence that I appreciate the honor you have bestowed upon me. That the past and present success of this Association may be but an earnest of its future growth and usefulness, and that prosperity and happiness, with length of days, may be the lot of every member is the heartfelt wish of your retiring President.

Mr. Wurzburg—You have heard the reading of the address, what action will you take?

Dr. Prescort—I move that a committee be appointed to consider the several recommendations and report to the Association.

Carried.

The President here resumed the chair.

THE PRESIDENT—The next order of business is the presentation of names for membership.

THE SECRETARY—Mr. President, the following applications have been examined by the Executive Committee, and are presented to the Association with the recommendation that the several applicants be elected:

Amberg, Isaac, Battle Creek. Andrus, E. J., Utica. Bailey, Morrison, Plainwell. Barker, Wm. J., Hart. Beaman, G. W., East Jordan. Blakeslee, N. P., Elmira. Brundage, Fred., Muskegon. Chapple, Leander D., Wayland. Conrad, John F., Otsego. Crane, Geo. W., Cheboygan. Crispe, John, Plainwell. Crookston J. A., G'd Rapids. Culver, R. W., Battle Creek. Davie, Robert P., Flushing. Fairchild, H. B., G'd Rapids. Fenton, Ambrose W., Bailey. Foote, Charles E., Jackson. Foster, Albert R., Otsego. Fox, John R., Cedar Springs. Geary, Samuel M., Maple Hill. Hacket, Philo E., Wolverine. Haight, Arthur L., Woodland. Hamilton, E. A., White Pigeon. Haynes, David O., Detroit. Hazeltine, A. F., G'd Rapids. Hinds, Elisha J., Midland. Hutly, F. A., Grand Haven. Jamison, T. A., S. Boardman. Kellogg, A. F., Cedar Lake. Kennedy, Thos. B., Commerce. Kimm, Derk, Grand Rapids. Kimm, M. B., Grand Rapids. Kinsel, Wm. S., Detroit. Leland, Norman P., Gaines. Lusk, Geo. L., Owosso.

Mandigo, Della, Sherwood. McHenry, G.A., Chippewa Lake. McNeal, Byron, Byron Centre. Miller, Nicholas, Fremont. Milner, Charles H., Big Rapids. · Mills, Lloyd M., G'd Rapids. Muir, John D., Grand Rapids. Noyes, Kirke W., Paw Paw. Orr, Elmer N., Manistique. Owen, Wm. H., Maple Rapids. Paige, Leslie E., Sparta. Parker, Orlando J., Howell. Passage, John H., Greenville, Perrigo, L., Burnip's Corners. Dunham, Elisha M., G'd Rapids. Preston, Thomas W., Millbrook. Rogers, LeRoy, Eastport. Rundel, John, Holton. Runner, J. Wallace, Shelby. Rudolphi, Arthur E., Dowagiac. Slawson, Wm. W., Greenville. Smith, A. Lee, Crystal. Spayde, Wm. H., Bloomingdale Hagerman, Frank, Birmingham. Stevenson, Aug. W., Muskegon. Stiles, Thomas P., Chester. Stover, Henry E., Kalkaska, Suffield, Brice, Charlevoix. Terrill, Butler E., Muir. Thompson, H. G., Menominee. Tibbs, Wm. H., Grand Rapids. Tillitson, Wm. J., Laingsburg. Todd, Fred. J., Detroit. Tucker, Winfield S., Stanwood. Tullgren, Alfred, Iron Mountain. Turner, Robert, Flat Rock. Valler, James H., Evart. Vyne, Nicholas A., Fremont. Wagner, Adam, East Manville.

Waite, Clay M., Homer. Ward, Walter A., Eau Claire. Weaver, Ezra, Reading.

Webb, Byron S., Alma. Wells, C. A., Brockway Centre. Warne, Fremont C., E. Jordan. White, Wm. E., Grand Rapids. Warner, Spencer H., Marlette. Whitfield, Geo. F., G'd Rapids. Woolford, Rufus S., Mecosta.

Upon motion the Secretary was instructed to cast the ballot of the Association, and the applicants were declared elected.

The next order of business was the report from the Michigan Board of Pharmacy, as required by section 2 of "An Act to Regulate the Practice of Pharmacy in the State of Michigan." [Act No. 134, Laws 1885.]

The report was presented and read by the Secretary of the Board, an abstract of which is as follows:

The Board was appointed by Governor Alger on June 12, 1885, and consists of Ottmar Eberbach, of Ann Arbor, James Vernor, Detroit, Jacob Jesson, Muskegon, Forentin H. J. Van Emster, Bay City, and George McDonald, Kalamazoo. Board held its first meeting in Lansing, and organized by electing Ottmar Eberbach President, Jacob Jesson Secretary, and James Vernor Treasurer.

The total number of registered pharmacists to date is as follows:

Registered Pharmacists (Section 4)	2,	712
Registered Pharmacist Licentiates (Section 5)	:	120
Registered Assistants	••	183
Total	8,0	015
Total cash received as follows:		
2,712 Registered Pharmacists, \$2.00 each	\$5,424	00
120 Registered Pharmacist Licentiates, \$3.00 each	360	00
183 Registered Assistants, \$1.00 each	183	00
40 Applications for examination on file	120	00

The total expenditures of the Board, including stationery, blank book, per diem and traveling expenses of members,		
hall rents for examination meetings, safe, salary of officers,		
postage, etc., amount to,	\$2,828	77
Deposited with the State Treasurer, as required by Section 3	2.500	
Balance on hand for current incidental expenses	758	23
Total	\$6.087	00

The Board has settled with the Board of State Auditors, as required by Section 3.

The complete report, giving itemized statements, is in the hands of the Secretary, Mr. Parkill. The report contains also the minutes of the meetings, and the names and postoffice address of the registered pharmacists of the State, arranged by counties. The Secretary of the Board, or any of the members, will promptly answer all questions submitted.

The Pharmacy Law went into full effect December 18, 1885, consequently it has been in force less than one year.

The law requires a report upon the condition of pharmacy in the State; this being the first year of the law it is impossible at this time to render such a report at all complete.

Before the passage of the law any person could engage in the practice of pharmacy without being qualified; now a person must, in order to own a drug store, either be a registered pharmacist, or place a registered pharmacist in charge of his business.

The fact that 156 persons have been examined by the Board during the first year goes to show that it is quite impossible to secure a situation, or manage a pharmacy, without being registered. Thirty-six failed to pass, and one hundred and twenty passed a satisfactory examination. The highest percentage attained was 90 per cent., the lowest 50 per cent., the average 64 per cent. The average of those that failed was 35 per cent.

There have been as yet no prosecutions under the law. A number of cases have been reported, but they have been settled, either by the person passing the examination (providing he was competent) or placing a registered pharmacist in charge of the business.

The Board has held five meetings during the year, three regular and two special, one in Lansing, one in Muskegon, one in Grand Rapids, and two in Detroit.

Anonymous communications, of which a large number have been received, will not, for good reasons, receive attention.

The following are rulings that have been adopted by the Board in carrying out the provisions of the Pharmacy Act.

RULINGS.

- 1. The Board rule that any person who is engaged as proprietor of a pharmacy on September 18, 1885, or as clerk with three years' (or more) experience, so engaged on September 18, 1885, shall be registered as registered pharmacists, and clerks with over two years' experience (but not three years) so engaged on September 18, 1885, shall be registered as registered assistant pharmacists.
- 2. The Board rule that in the interim between the filing of an application and the date set by the Board for the examination of the applicant he may continue to act as assistant pharmacist. Due notice will be given applicants of the time and place set for their examination.
- 3. The Board rule that licentiates of other State Boards will not be recognized or registered without passing the examination.
- 4. The Board rule that a registered assistant pharmacist may be allowed to remain in charge of a pharmacy during those temporary absences of the registered pharmacist in charge of such pharmacy, which are incidental to any business.
- 5. The Board rule that in the absence of an affidavit stating that the affidavit of an applicant is false the affidavit of applicants for registration must be accepted and certificates of registration granted.
- 6. The Board rule that all persons not less than 18 years of age who were engaged in the practice of pharmacy in the State of Michigan for a period of less than two years prior to the 18th day of September, 1885, and who were so engaged in the State at that time shall, after they have completed two full years of service in the practice of pharmacy in the State, upon making application in due form, be entitled to the certificate of a regisistered assistant pharmacist.

- 7. The Board rule that all applicants for examination as licentiates in pharmacy who fail to pass the examination, or who, for satisfactory reasons, were unable to attend such examination, be permitted to act as assistant pharmacist until the next meeting held by the Board for examination of candidates as licentiates in pharmacy.
- 8 The Board rule that any registered pharmacist or registered assistant pharmacist, while absent from the store, may keep up his registration by paying the annual fee when due, and unless such fee is paid and registration thus continued then they must come before the Board for examination before a new certificate will be issued to them.

Mr. Wells—I would like to hear one of the rules read again, I think the 4th, concerning assistants in pharmacy.

Mr. Jesson—The rule is as follows:

The Board rule that a registered assistant pharmacist may be allowed to remain in charge of a pharmacy during those temporary absences of the registered pharmacist in charge of such pharmacy, which are incidental to any business.

This question was raised in a meeting of the Board, and the minutes will show it was decided to refer all such questions that might arise to Mr. Ashley Pond, of Detroit, for his opinion. Upon that question I had better read his legal opinion, upon which the above rule was based:

"A registered assistant cannot conduct a business on his own account, nor in behalf of another; but he may be allowed to remain in charge during those temporary absences of the proprietor which are incidental to any business.

"It would be impossible to measure by hours the period during which an assistant may act in that capacity. The purpose of the restriction is to prevent a proprietor from delegating the responsibility which he has under the Act to an assistant. In each case the question must be whether there has been a practical surrender of the business to the assistant for more than a temporary purpose.

"No qualification of age can be required of those entitled to registration under Section 4 of the Act.

"Licentiates of the Michigan Board of Pharmacy must be 18 years of age, and such qualification may, in the discretion of the Board, also be required from the licentiates of other Boards,"

Mr. Wells—I would like to inquire of the Secretary of the State Board of Pharmacy what the Board ruled in relation to

the duties of the assistants in pharmacy who have not passed an examination. Are they allowed to practice pharmacy under this ruling? Are they allowed to put up prescriptions and dispense medicines when not directly under the supervision of a registered pharmacist?

Mr. JESSON—The law, in Section 6, gives him that privilege.

Mr. Wells—I understand that section; it simply applies to those who were in business at the time the law took effect; I would like to inquire of the Secretary what the rule is, or what the Board has ruled, whether such persons are privileged to put up prescriptions and dispense medicines who were not in business at the time the law went into effect?

Mr. Jesson-No sir, not those who were not in business.

Mr. Wells—I had understood that they did, that they were allowed the privilege under that ruling, if they were not in business at the time the law went into effect.

Mr. Jesson—I see your point, I think. Where a man applies for an examination we have been in the habit of giving him permission to act as an assistant until the time set for his examination, but not any further than that. The Registrer supposes he is competent and will allow him to go on and act as assistant until the time set for his examination.

THE PRESIDENT—Are there any further remarks, or questions to ask Mr. Jesson with regard to his report? What is the pleasure of the Association with regard to this report?

Mr. Gundrum, of Ionia—I move that the report of the Secretary of the Board of Pharmacy be accepted.

Carried.

THE PRESIDENT—I will announce the committee upon the President's address: E. T. Webb, Jackson; Charles Wright, Detroit, and G. W. Crouter, Charlevoix.

If there are no objections we will proceed with the reading of some of the papers, if the committee who have the matter in charge are ready to present them.

A. B. Stevens, of Detroit—I think the committee have stepped out after papers, but I think some of the other committees are ready to report.

THE PRESIDENT—I think it would expedite business.

THE SECRETARY—The Executive Committee report favorably upon the following names:

Boehnlein, Geo., Detroit. Federer, E. C., Detroit. Hunt, Frank J., Detroit. Lonsbury, J. H.. Reed City. Orth, Louis P., Traverse City. Rodembaugh, I. N., Mancelona.

On motion the Secretary was instructed to cast the ballot of the Association and the members were declared elected.

THE PRESIDENT—The Committee on Papers and Queries have some papers to present, and we will devote the remainder of the session to the reading of papers.

Dr. Prescorr — The Committee have a list of 18 or 20 papers, shorter or longer, many of which, the Committee think, the Association will be desirous of discussing. Mr. H. W. Snow will present a paper in answer to the query:

"What proportion of solid extract should be yielded by various drugs? Is it possible to standardize those extracts so that one part of the extract shall represent five parts of the drug?"

Mr. Snow gave a synopsis of the paper, which will be found in full in subsequent pages.

Dr. Prescott—Mr. Stevens will read a paper on "Plants Indigenous to Ann Arbor," by A. W. and W. T. Doty of the class of '86, and A. W. Smith of the class of '85, Michigan University School of Pharmacy.

The paper was accompanied by a collection of herbarium specimens, embracing 39 orders and 75 species, which were exhibited with explanations by Mr. Stevens.

For paper see subsequent pages.

Papers were next read in answer to the query: "What is the quantity of Caffeine in the Coffee of the different brands in use in this State?" by E. D. Smith, and in answer to the query: "What is the acid strength of the Aromatic Sulphuric Acid in use?" by E. W. Clark.

For papers see subsequent pages.

Mr. Prescott—Mr. C. G. Stone, of Detroit, at present engaged in traveling in a pharmaceutical business, accepted the query: "To what extent is the metric system now used by Physicians?" Mr. Stone states that he has prepared no formal response to this query, yet he does give a reply in a certain sense. Mr. Stone's business takes him through several States, and brings him in contact with many of the leading physicians; he states as the result of his investigations that the metric system is not in use to any extent, and is not growing in popularity among physicians.

The President—Upon that question of the use of the metric system I will say: Some ten years ago I spent four years in the practice of pharmacy in the State of Rhode Island; I think during the last year I was there fully one-third of all prescriptions that were received were written in that system. It emanated from Boston. They have there a bureau called the "Metric System Bureau" that sent out metric tables, and distributed books and pamphlets to encourage the use of the metric system. If thought advisable to encourage the use of that system in this State, it is quite possible this Association might obtain from that bureau some matter they could distribute to advantage among the druggists and physicians and thus call attention to it, and perhaps bring it into more general use.

Mr. Jesson—About four years ago I recommended to a number of our physicians in Muskegon the use of the metric system, which has been adopted by four, and finally by one more, making five that use it; four are using it habitually. I can say both for myself and clerks that I much prefer it to the old style. I think, of course, there are things that can be said against it, but I think there are many things in its favor. The Pharmacopæia is based upon that system, and I feel like recommending it wherever I can with prudence.

Mr. Wells—I would like to hear from the active members of the Association, what their experience is with regard to the system as far as its growing popularity or unpopularity is concerned. In my own limited experience I don't think it is liked. I would like to hear from some of our brethren in Detroit where

there is a larger prescription business being done than in the country. I would like to know whether they think it is growing in popularity, and whether they like it themselves.

Prof. Prescorr—There could be no better opportunity to learn to what extent it is employed in the State than the present.

Mr. Wells-I would like to hear from Mr. Bassett.

Mr. Bassett—Mr. President, I have made my speech, and I don't know as I have got anything more to say; but my experience with the metric system has been very limited. I don't, in my store, do a large prescription business, and I don't think that I have had a dozen prescriptions in the last year written in that system. We did have, some two or three years ago when it was first talked about to any extent, quite a number; but my impression is, that it is falling out of use among our physicians in Detroit.

Mr. F. W. R. Perry, of Detroit—I can carry out what Mr. Bassett says. I only have one prescription in twenty-five in the metric system, there is a German physician using the metric system; I know but one American physician that uses it. For myself, I use the metric system in making preparations; I follow the Pharmacopoeia, and like it very much.

Mr. A. B. Stevens—I have known of physicians who have obtained their education abroad and come back here to practice Some of them said they who at first used the metric system. preferred it, but they did not continue to use it for this reason: that they did not wish to show off their superior knowledge. had a young man who had worked in another store some length of time and had used the old weights and measures. came to my store of course he had to use the metric system to manufacture by, using weights entirely. After he had tried it he said he preferred it to the other system. That has been our experience with it, and I would like to know how many pharmacists use it in manufacturing. I think there are more using it in that way, perhaps, than there are physicians that prescribe with it.

Mr. Wells—I would like to hear from some of our Grand Rapids brethren.

Mr. Wurzburg—As far as my experience goes I know of but two physicians in this city who use the metric system. One of these is a German physician and the other is an American. I do not think it is very popular here; certainly it is not growing in popularity.

THE PRESIDENT—I would ask if the reason that physicians do not use it is not owing to the fact that pharmacists have not the facilities for using it, and physicians don't like to send prescriptions to a drug store and have the druggist convert them into apothecaries weights and measures?

A MEMBER—I am not acquainted with it, and I think that physicians are not generally in favor of it, and therefore it is not in use.

Mr. A. M. Todd—In my own experience in manufacturing, and especially in the labratory, I do not remember that I ever have used the metric system. I did not commence experiments in chemistry until the metric system had been authorized in this country to some extent. I find I am quite liable to make mistakes if I attempt to reckon accounts in pounds, shillings, and pence, but I very seldom make mistakes when I compute in the decimal system. It is always difficult to make calculations in any system in which the ratio is constantly changed. see no reason which any person can give for not using the Decimal System, except that he has been accustomed to the other system. I should say it was very much as an American prefers to speak in the English language rather than a foreign tongue with which he is not familiar, although the latter may afford a simpler mode of expressing thought.

Mr. Wells—I would like to inquire of Prof. Prescott if in the medical school at Ann Arbor, the metric system is taught in preference to the other system, to the graduates of that school?

Prof. Prescorr—As physicians, it is not—that is, it is not especially taught to any great extent for use in prescriptions.

The principal practice in prescription writing by the medical students is in the ordinary English or American system of weights and measures. Of course the metric system is used in all the analytical work where absolute quantity is sought or is given.

Mr. Gundrum—I use the metric weights in making preparations. In the store I have a set of small weights. nothing above a ten grain weight, so I use nickels, of which I have a box full. I should explain that a nickel, if just what it should be, weighs exactly five grams. Some will weigh a little more and some a little less. Sometimes you will have to weigh twenty before you get one weighing exactly five grams, but enough such can be soon collected to serve every pur-I never had any difficulty in making preparations by the formulas of the Pharmacopœia. Sometimes when I have an exact weight to make up, I have to figure down to grains. all that I can see, it is as easy to make the preparations with pounds and ounces as with grams. I don't put up as many prescriptions as some, but I will give my experience for what it is worth. I don't find as many prescriptions written in the metric system now as I did five, six, and ten years ago.

Dr. Lyons—I have a paper upon the subject of weights and measures of the Pharmacopœia, and I will not say much in this connection. The introduction of the metric system in this country is not likely to succeed unless there is some strong pressure or legal enactment brought to bear. A few physicians get their education in Europe and come here and are very enthusiastic over it. Partly because it is something new, and partly because of its unquestionable advantages, they have Perhaps for a while they continue to write prescriptions as they have learned to write them, but the most of them very soon fall into the old ways, and write their prescriptions in the ordinary weights and measures. Everything is against the introduction of the strange system. They are all familiar with the old weights. They are something we have occasion to use in our every-day transactions. In order to learn to use new ones, we must have occasion to use them. wanted to say just now with regard to the Pharmacopœial formulas is this: although they are not metric, although they do not use the metric weights, they are decimal, and translating the formulas into the ordinary method of reckoning involves a mathematical calculation which is not in itself peculiarly difficult, but is irksome, as are all mathematical calculations to the most of us. I shall present a paper which elaborates more fully these ideas, sometime in the course of this meeting.

For the paper in full see subsequent pages.

THE PRESIDENT—Would it not be well to have this paper now while we are on this subject. If you are ready it is just as well to dispose of the subject while it is fresh.

Instead of reading the paper in full, Dr. Lyons gave a synopsis of its contents. Its title was, "What system should be recommended for adoption in the next Pharmacoposia?"

THE PRESIDENT—You have heard the paper of Dr. Lyons. I took a great deal of interest in it, and no doubt you all have. We would be glad if any one has any remarks to make upon it.

Mr. EBERBACH—I wish to state here, that since the introduction of the change in the Pharmacopæia we have adopted the decimal practice in the work of our laboratory. I find it is a very excellent method to adopt, with young men especially. There is absolutely no chance to make a mistake, the calculations being simple. As far as prescriptions are concerned, our experience is, as a rule, physicians prefer to adhere to the old system. They are accustomed to it. We have one physician in Ann Arbor that uses the metric system, who happened to be a young physician that has been connected with the Association for a number of years, and a pharmacist for upwards of ten years. He stated that he got accustomed to that system, but in general practice most of the physicians connected with the society use the old system.

Prof. Prescorr—As another Pharmacopæia must soon be prepared it may be worth while to recall one or two of the prominent features in the history of the pharmacopæial change in this regard.

It should be observed that the number of medical delegates in the convention has always very largely exceeded that of the pharmaceutical delegates. The number present of the medical men has been, in several of the later conventions, more than double the number of pharmacists present.

To me it is very difficult to account for the action of the medical delegates to the last two conventions. You will remember that in 1870 it was ordered by the convention, that liquids were to be weighed in the preparations of the Pharmacopœia. A committee of 25, I believe, was appointed and they fell to work. They found that the task of the conversion of volume into weight for all the liquids, and the changing of the formulæ was more than they could undertake, and they simply declined to follow instructions. They stated that they could not do it, and they didn't do it. Ten years after, another convention met, and they again ordered that liquids should be weighed, and again a committee of revision, of 25 members, was appointed, a large portion of them pharmaceutical members, but still a fair majority of them medical representatives on the committee. That committee carried out the instructions given them, except that for fluid extracts they adopted a volume standard. The fluid extracts of the Pharmacopæia are made up to a certain volume, while the tinctures are made up to a certain weight.

Dr. Lyons—I omitted to mention one important objection to the practice of measuring fluids, which was brought strongly to my attention a few days ago. I had occasion to test some graduates, among them two which were supposed to hold and measure two pints. Up to one pint the graduate measures were fairly correct, but the second pint in one overran nearly two ounces, while in the other it fell short almost two ounces. The majority of pharmacists would not have thought of verifying their graduates and so in using these would have made errors amounting, perhaps, to 25 per cent in the quantities measured with them.

THE PRESIDENT—The average was about right, was it not?

Dr. Lyons—Yes, they averaged very well indeed.

Mr. Hibbard—The use of the metric system was brought before the Wisconsin Society and discussed at some length, and it was almost universally condemned as creating a great many mistakes in putting up prescriptions. There are many German physicians there and a great many German druggists, and yet, as a class, they condemned it and preferred the old system.

THE PRESIDENT—If the physicians should use the system, and if druggists generally should use it, it could not be employed in writing the directions. If the directions were written to give two grains of a mixture every three hours, it would not be understood by the ordinary class of people, they wouldn't know anything about it. You have got to give directions in tablespoonfuls, or teaspoonfuls, or wine-glassfuls. Again, druggists and physicians who have been accustomed to the old system, in order to use the new system well, have got to unlearn the old; they have got to drive it out of their minds.

Mr. Bassett-I have been deeply interested in this discussion with regard to the Pharmacopæia. At the risk of being called unprogressive, old fogyish, or something of that kind, I want to express my mind in brief. Now, I have a Pharmacopœia of the latest edition lying on a shelf in my store, and I think, possibly, we may open it once a month, and maybe, not once in two months. It is for sale very cheap. We have the latest edition of the Dispensatory, and whenever we wish to make anything, we invariably turn to the Dispensatory and use the weights and measures to which we have been accustomed from our childhood, and which is a part of an American's education. Now, it is all well enough to stand up here and say these computations are very easily made—that it is a matter of a very little figuring. The less figuring a druggist has to do of that kind, when he is in a hurry, the better he is off. That way is explicit where we are directed to take so many grains, ounces, and so many fluid ounces and put them together. We know all the while what will be the amount and volume. But with the other way, we are to take so many parts and add so many parts of something else and make it up into so many parts, and unless we go to work and figure it out, we don't know what we are going to have when we get done. Dr. Lyons said he figured it down, and that the National and the United States Dispensatories show a difference of six per cent. Now, a six per cent. mistake means a man's life, sometimes. I say we ought not to expect druggists and pharmacists to make these calculations. The metric system is un-American. Some of our young men go over to Europe to get a medical education. They come back here very much in favor of the metric system. They use it for a while, and then drop it. Just so some young men go from here to New York, and become very much enamored with a particular glass for the eye, and come back wearing that, but they often drop that also. We are not required to bring those things over here. We have a system of weights and measures that we understand. We teach it to our children from the moment they go into our public schools. We have grown up under that system. It is bred in the bone. I always opposed the new system of compounding. I never said so much about it before. Now, I hope this convention will stand by the old system, and, if possible, try to get a change at the next revision of the Pharmacopœia.

Mr. Stevens—I defy any man to find an instance where one who has really used the formulæ of the Pharmacopæia has gone back to the old plan. It is only those who insist on working in the old way who are compelled to make mathematical calculations. They are not required by the Pharmacopæia.

Upon motion the Association adjourned to meet at 7 o'clock P. M.

SECOND SESSION.

TUESDAY EVENING.

The Association was called to order by the President at 7 o'clock, P. M.

THE PRESIDENT—We will devote a little time to the questions in the question box in charge of the Committee on Queries.

Mr. EBERBACH—The first question is as follows: "Is Hydrate of Chloral incompatible with Bromide of Potassium; is there any danger in the use of the two combined?"

Mr. Eberbach—That question first came up, perhaps fifteen months ago in the Massachusetts Association. Professor Markoe

showed that in the presence of alcohol the substances were not compatible, the chloral forming a sparingly soluble alcoholate. The two substances are incompatible when alcohol is present in certain proportion, otherwise they are perfectly compatible, and are very frequently prescribed together.

Mr. A. B. Stevens—One of our queries (not accepted) relates to this subject.

Mr. EBERBACH—The next question is:

"What chemical action takes place in carbolic acid when it turns scarlet upon exposure to the air."

Dr. Prescorr—That is a question that has not yet been satisfactorily answered.

THE PRESIDENT—Who will enlighten us upon that question? Who cares to undertake to answer that question? We will pass to another one.

Mr. EBERBACH—How many druggists present use the Pharmacopœia in their business in preference to the Dispensatory? Please call for a rising vote.

A rising vote was taken which showed a decisive preference for the Dispensatory.

Mr. EBERBACH—The next question is as follows:

"Has a person who is not registered as an assistant in pharmacy a right to put up prescriptions if under the eye of a registered pharmacist?"

As the Board understands the law, a pharmacist can permit an apprentice to put up prescriptions in his store, provided the pharmacist or registered assistant, who is a registered pharmacist, superintends the work; but the apprentice is not permitted to compound any prescriptions unless he is so superintended.

THE PRESIDENT—In other words, the apprentice must be supervised by a registered pharmacist and not by an assistant.

Mr. EBERBACH—" Are potassium chlorate and ammonium hydrochlorate compatible put in compressed tablets?"

Dr. Lyons—That question was suggested to get the observations, if there have been any, of the members of the Association

on that point. Several cases have been reported in the Pharmaceutical Journal, showing that compressed tablets of the composition stated do sometimes become decomposed, in some cases leading to ignition of the mixture. In one instance the heat produced was so intense that the glass vessel was fairly fused by it. In another case an explosion took place. Possibly there is chloride of nitrogen produced as one step in the chemical reaction. You are aware of the fact that this compound is produced by the action of chlorine on ammonium hydrochlorate, and you know that the compound is one of the most explosive known. Whether or not this has anything to do with the true explanation of these accidents, it has been observed that as long as the tablets are left freely exposed to the air, or kept in paper boxes or similar packages, there is no difficulty. If you put these tablets up in a bottle and leave them a few months you will find that the chlorine is liberated. Probably the ammonia salt is partially decomposed; it loses ammonia, and the result is that hydrochloric acid is set free; this reacts on the potassium chlorate, producing euchlorine, which in turn reacts on the ammonium salt. As long as the tablets are kept in paper or pasteboard boxes there is no danger.

Mr. EBERBACH—"What right has a practicing physician under the State pharmacy law? Can a physician conduct a drug store without registering?" In answer to this question I will say, as a member of the Board, that the State law provides, under section 10—I think 9 or 10—that physicians are permitted to run their own dispensing office, and put up prescriptions in their own proper office, but to open a drug store—in the meaning of the Pharmacy Act—they are obliged to appear before the Board and pass their examination on the same grounds that any other citizen would have to to conduct a pharmacy legally.

THE PRESIDENT—I suppose that disposes of that question beyond any doubt.

Mr. Wells—Dr. W. E. Shorts, who was a very active member of the legislature two years ago when our pharmacy law was passed, rendered the Committee upon Legislation very valuable assistance in securing the passage of the law. He is present in the room, and I would be very glad if the Doctor would make a few remarks before the Association, and I think the Association would be very glad to hear from Dr. Shorts.

Dr. W. E. Shorts-Mr. President, and ladies and gentlemen—it is with a great degree of pleasure that I arise to respond to your call; not because I have any particular pleasure in attempting to address such a highly educated body as this, but it is because I have always had a hearty and deep interest in the welfare of anything which pertained to my chosen profession in the true sense. I look upon the profession of pharmacy as a profession in the true sense, one well worth the careful attention of the medical profession I believe that the two professions ought to go hand in hand. Mr. President, I have discharged only what I felt was my simple duty while engaged in representing our little district in the legislature. I felt I was doing my duty to the sick and suffering of our land. I feel if there is any class who needs this duty, it is the sick. In my efforts to aid in securing the elevation of the standard of pharmaceutical knowledge, I have been mindful of those who are dependent upon the pharmacist in the hours of sickness.

I have looked upon the practice of pharmacy in our State of Michigan up to the present time as in a deplorable condition, because of the fact that many were in the ranks of the noble profession who were not worthy to be termed pharmacists. We know that many have attempted to act in that capacity who were not in any sense fit for the position, and we physicians suffered much at the hands of those men by reason of their ignorance. When we suffered, surely the sick suffered. So, my friends, whatever I did in behalf of your chosen profession was certainly done in behalf of the sick. I feel that I am not entitled to any credit.

I assure you I did not come down here with any expectation of addressing this honorable body by any means. It is a great pleasure to me to meet you, because I meet those who I know are true to the obligations which they have taken in their profession—because I know that you are men well worthy of occupying the position in society that you do, and I know that in meeting

with you I meet with those who are well capable of lifting me up and benefiting me by associating with you as much as it is possible for me to benefit you by my associating with you.

Mr. President, I thank you for the pleasure which this opportunity has afforded me, and I hope you will excuse me from any further remarks.

Mr. Wells-Mr. President: I will say in conclusion to the kind words the Doctor has spoken to us, I hope if we have occasion to go to the legislature again, he will be there, and be able to give us as good justice as he did before.

THE PRESIDENT—The next thing in order is the reading and discussion of papers.

Dr. Prescott—Query 31 reads as follows:

"Alkaloidal valuations of fluid extract of Veratrum viride are desired." Mr. H. W. Snow, of Detroit, will respond to the query.

The paper was then read by Mr. Snow.

Dr. Prescort—Query No. 19 reads, "What is the quality of the citrate of caffeine in the market?" Accepted by O. Scherer.

In absence of the writer the paper was read by Mr. A. B. Stevens.

For these papers see subsequent pages.

Dr. Lyons—The conclusions of this paper call to my mind an observation I have made with regard to another alkaloid, hydrastine. I undertook to bring into solution together a salt of hydrastine and the soluble citrate of bismuth. I found that nearly the whole of the hydrastine crystallized out of the mixture in the form of free alkaloid. It would seem that there was in the first instance a double decomposition of the salt, but in the case of the citrate of hydrastine, the affinity between the constituents was so slight that the alkaloid separated from the citrate acid and crystallized out. There is a preparation found in the market which purports to contain both hydrastine and bismuth, but I found in it no more than traces of the alkaloid.

Mr. Snow—I would like to inquire of Dr. Lyons whether in his experiment it was an aqueous solution or an alcoholic solution that was attempted. Dr. Lyons—I tried water, dilute spirit and a menstruum consisting partly of glycerine, but always with the same results.

Mr. Prescorr—I desire, before the reading of another paper, to make a request from members of this Association for next year. We have two question boxes—one box for questions to be answered at this meeting, and another for questions to be answered next year.

I am requested also to announce that those who furnish papers in answer to queries have a right to decide as to what journal shall have them for publication. There are a great many journals represented. It has been the practice heretofore of leaving the matter in the hands of the Committee on Papers and Queries to decide as to which journal shall have the papers, and that committee, of course, don't like to decide be ween them. If the author of any paper has a preference, he can exercise his right in the matter, and determine for himself in what journal it shall appear if asked for.

I have prepared an answer to query No. 28, "What course of reading, and plan of study are advisory for the assistant in pharmacy?" which I will now read.

For paper see subsequent pages.

Mr. Basserr—I don't know what the condition of the finances of the Association is, but I wish to make a suggestion. It seems to me that the paper Professor Prescott has just read is one of great value, and one that might be of great service to the trade throughout the State if it was in proper hands. I would like to suggest the idea of having this paper printed by itself and bound in a reasonably substantial manner, and distributed throughout this State—that is, one copy to every pharmacist, every registered pharmacist, in the State, that they may have it as a means of reference for their clerks and apprentices to conduct their course of study upon. I don't know that our means will admit of that course, but it seems to me it would be an excellent thing to do.

Mr. JESSON—The cost of the publication would not be very great, inasmuch as it would be a reprint from the proceedings, and the type would be already set up, and it would be simply the cost of the press work and binding.

Mr. Basserr—It is also with the understanding that Dr. Prescott would be willing to have this done.

Dr. Prescott—The writer of the paper acknowledges gratefully the kind appreciation just expressed by Mr. Bassett; it seems to me that the proceedings, in which I hope it will appear, will go into nearly all the drug stores of the State where it will be likely to receive the same favor and interest as when read; nothing further is desired. If it adds anything to the value of the proceedings, I shall be very glad; and further, I would say, with all due respect to Mr. Bassett, I do not think that he, or anybody else, could well decide upon a single reading of that paper just as it stands, such special action as the distribution of a single article. But if thought best I should wish to have it referred to a committee for their inspection and judgment.

Mr. A. B. Stevens—There is just this much about publishing such a paper in the proceedings, that there are a great many assistant and registered pharmacists, into whose hands these proceedings would come, who would not read an article of this kind, perhaps would not single it out from the others. It might be overlooked, when, if put in a pamphlet form, it would be called especially to their attention. A great many get the book and lay it down on their desk. I have not read all the articles in the proceedings of last year by a good deal, and I doubt if anybody has, but if printed in this way it would call their separate attention. The cost would be certainly very small. I have myself listened very attentively to the proposition made by Mr. Bassett, and I move, according to his suggestion, that it be printed.

THE PRESIDENT—The motion would be to refer the matter to a committee.

Mr. Wells—I don't see any object in referring this to a committee. I don't believe there is a member of the Association present that is not perfectly willing to take it just as it is. I don't think that a committee would improve the production at all, and I think the remarks of Mr. Stevens and Mr. Bassett are very appropriate; I think they appeal to every member of the Association present who has heard this paper; it certainly is a

valuable one, and is calculated to do a great deal of good if placed in the hands of druggists and pharmacists. I would therefore support the motion that this paper, after having been published in the proceedings, be published under the auspices of the Secretary or a committee—should one be appointed—on publication, and that it be distributed to every registered pharmacist in this State. It will come with authority from this Association, and, it seems to me, will be of very great value to the interests of pharmacy in this State.

Carried.

THE SECRETARY—Mr. President, the Executive Committee report favorably upon the following applications: Colwell, Charles B., Jackson; Halladay, Oliver A., Hoytville; Messick, H. J., Plainwell.

The Secretary was instructed to cast the ballot of the Association for the applicants, and they were declared elected.

THE PRESIDENT—The Association has received an invitation from the Anti-Kalsomine and Alabastine Company to visit their works to-morrow afternoon. Our programme calls for a session that afternoon. If we accept the invitation we will have to omit the afternoon session. I call the attention of the Association to the matter, and ask your pleasure with regard to it.

On motion it was resolved that the Association accept the invitation

It was also moved and carried that the report of the Committee on Trade Interests should follow the report of the Treasurer, previous to the reading and discussion of papers Wednesday morning.

The Association then adjourned to meet at 8 o'clock Wednesday morning.

THIRD SESSION.

WEDNESDAY, 8 O'CLOCK A. M.

The Association was called to order by the President, who said: The first thing on the programme is unfinished business. Has the Secretary any unfinished business on his table?

THE SECRETARY—There is to be a committee appointed on Exhibits.

Upon motion the President appointed a committee of five upon exhibits, as follows:

Allen, A. W., Detroit.

Beaman, G. W., East Jordan.

Caldwell, J. W., Detroit.

Harwood, Henry, Ishpeming.

Snow, S. M., Ludington.

THE PRESIDENT—The next order is the report of the Committee on Legislation. Is that committee ready to report? That committee not being ready to report, we will pass it.

The next order is the report of the Committee on Formulary.

The report of the Committee on Formulary was read by A. B. Prescott.

REPORT OF THE COMMITTEE ON FORMULARY.

The committe, at an early period after its formation, communicated with the presiding officers of the local pharmaceutical societies of the State, viz: The Detroit Pharmaceutical Society; The Grand Rapids Pharmaceutical Society; The Jackson County Pharmaceutical Association, and the Saginaw County Pharmaceutical Society. These bodies were requested to furnish such recommendations of unofficial formulas of importance and value in use in their respective localities, as could be obtained. Also, a corresponding request was made of the local medical societies of the City of Detroit. Report was made to the Committee of the American Pharmaceutical Association on this subject. The circular letters of the last named committee were forwarded to the several local socie-Only a very few suggestions were as yet obtained in the replies of the several local societies, though all of them expressed interest in the matter. The suggestions which were obtained were forwarded to the A. P. A. Committee, in August, in obedience to their request to have material presented before the 15th of that month. At all events, the local societies of Michigan have had representation, or the opportunity of it before the A. P. A. Committee. Some of the undersigned members of your committee have desired to make some practical and experimental inquiries as to certain unofficinal formulas, but have not been able to compass this with other duties.

Fully recognizing the desirability of regulating, restricting, and improving the unofficinal preparations in use in this country, and well assured that every State should be represented in the work of the Committee of the American Pharmaceutical Association, this committee is gratified to see that the last named body has been continued and made a broadly representative body, by its organization inclusive of a delegate member from each State Society in pharmacy. Such a delegate member will, of course, be appointed from this Association, and, therefore, no occasion will remain for the continuance of this committee.

Signed, A. B. PRESCOTT,
A. B. LYONS,
O. EBERBACH,
F. J. WURZBURG,
FRANK INGLIS.

THE PRESIDENT—You have heard the report. What action shall be taken upon it?

Mr. Wells—I move that it be received and adopted. Carried.

THE PRESIDENT—The chairman of the Committee on Legislation has arrived and is ready to report.

The report of the Committee on Legislation was read by C. F. Philips, as follows:

REPORT OF THE COMMITTEE ON LEGISLATION.

The subject of pharmaceutical legislation has of late grown to be one of great interest to pharmacists and Pharmaceutical Associations in general. This is shown by the fact that twenty States have enacted pharmacy laws, and new ones are being added to the list every year.

Since our last meeting Virginia and Wyoming have enacted laws regulating the practice of pharmacy, and New Jersey and Iowa have amended and greatly improved their old ones. The Massachusetts law too went into effect January 1, 1886, which is since our last meeting.

The States enjoying these privileges up to the present time are Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Virginia, West Virginia, North Carolina, Georgia, Kentucky, Ohio, Michigan, Illinois, Iowa, Wisconsin, Minnesota, Kansas, and Wyoming, which makes, as before stated, twenty States. Vermont is sometimes mentioned in this connection, but an Act regulating the sale of poisons is all the legislation existing in this direction in Vermont at present, and would not be called a pharmacy law.

The members of the Michigan State Pharmaceutical Association have just cause to feel proud of their achievements. The fact that they have placed upon the statute books of our State an Act that has real merit is evinced by the fact that the State Association of Nebraska adopted, at its last annual meeting, an almost verbatim copy of the Michigan law, to be presented at the next session of their Legislature.

One of the strong points in our law, and one over which there is considerable discussion in other States at present, and one too which our Association should ever guard carefully and endeavor to keep in force is the disregard of diploma distinctions. In their correspondence with the different States, your committee found that a sad state of things existed where this was not so. This is particularly the case in Maine, where their law allows physicians holding diplomas to become apothecaries without registration even.

State Associations cannot guard too closely the legislation they have already secured, nor scan too carefully the proposed amendments offered by legislative committees, as much harm has often come to good and effective laws by well-meant and perhaps well-worded amendments, when in the hands of the Legislature and open to the tinkering of the ones opposed to pharmaceutical legislation in general.

Your committee held one meeting (a joint meeting with the Board of Pharmacy) and determined, in view of the facts just mentioned, that although there be a few weak points in our law as it stands, to submit no amendments for your consideration.

In accord with the recommendation of the President, and also corresponding to the action of several of the Associations, your committee would submit what is familiar to you all, to be presented at the next session of the Legislature by the incoming committee, which is commonly styled the "Georgia Scarlet Label Morphia Law."

Respectfully submitted,

E. F. PHILLIPS, C. W. TAYLOR,

Committee.

THE PRESIDENT—You have heard the report of the Committee on Legislation. What action shall be taken on the report?

Mr. Wells—I move that the report be accepted and adopted. Carried.

THE PRESIDENT—The next business in order is the report of the Committee on the School of Pharmacy.

The report was read by the chairman of the committee, as follows:

REPORT OF COMMITTEE ON THE SCHOOL OF PHARMACY OF MICHIGAN UNIVERSITY.

Educational facilities of every description have multiplied in this country during the last twenty-five years with a bewildering rapidity. In the pioneer days, which for most of our States are still well remembered by men yet in their prime, each individual devoted himself to such pursuits as the growing wants of the community might demand without preparing himself by a regular course of training for his specific work. Indeed, there were few who did not find it necessary to practice more than one of the useful arts or trades, and it is due to Yankee genius to say that the adage "Jack at all trades, good at none," found few exemplifications, or else we must suppose that the law of the survival of the fittest operated with extraordinary certainty and rapidity. But society is rapidly organizing itself, the distribution of labor essential to a civilized community is already recognized as a necessity, and hence training schools in every branch of technical industry are every where springing into being.

It must inevitably happen, under such conditions, that there is great room for choice between schools ostensibly having the same object. Whether these are conducted under State patronage, or born of private enterprise, we must expect to find great differences in the thoroughness of the instruction imparted, and great diversities in the breadth or narrowness of views of their originators.

Our own State has largely forstalled private enterprise in furnishing opportunities for either a technical or a professional education. It has its schools of agriculture, of mining engineering, of dentistry, and of pharmacy, as well as of medicine, homeopathy, and law. Our State University is adding year by year new departments to those which already make it more complete than any similar institution in our country. We are all proud of its growth; its magnitude alone impresses us. The more thoughtful among us, however, reserve our full approbation of such an institution until we are convinced that, with the prestige of numbers and of State support in its favor, it is not standing in the way of real progress by keeping down the standard of educational requirement, instead of aiming rather to advance it.

It seems to have been some such thought that prompted the appointment by our Association of this committee; at all events this thought we have had in mind in carrying out the duty assigned to us. A more agreeable task could hardly be found than that assigned to the committee. There are few of us who would not be glad of an excuse to visit our University town, and no member of the Association but would esteem it a privilege to go through the University laboratories in the company of one to whom, not only the University School of Pharmacy, but our Association owes so much.

The visit of your committee was made during the earlier part of the school year. It afforded an opportunity to see the students at their work, both in the class room and in the laboratory. The first impression produced by the school as a whole was that it is a place for earnest thorough work. This was evident in the class room, where the industrious use of note books was an indication that the student expected the rigorous quiz and examination which they must pass creditably in order to continue in the course. In the various laboratories every one was earnestly occupied; it appeared as though each felt the necessity of improving the hour—whether from interest in the work in hand, or from pressure of necessity.

The first class of the University School of Pharmacy graduated in 1869, when twenty-three candidates received its degree; of these no less than sixteen were graduates in medicine. In later years there has been a steady increase of the number of those who have studied pharmacy with a view to obtaining a livelihood from its practice. The average number of students in each class is now about 40, and a large proportion of those in attendance take their degree and engage in the practice of pharmacy, or enter the higher branches of chemical technology.

The school grew out of the demand, in connection with the chemical laboratory, for specific training in pharmaceutical and medical chemistry. It was not like the school of dentistry and the school of homeopathy, a creation of the State, although, on this very account, the more deserving. The department of pharmacy has never directly received from the State any appropriation of money. It shared, indeed, in the benefits of a special appropriation made a few years ago for the chemical laboratory, but was not specifically mentioned in the appropriation.

The special mission of your visiting committee was to examine the practical working of the school, and see what opportunities it affords the student. From its announcement we learn that the school confers on its graduates the degree of pharmaceutical chemist. To obtain this the student is required to pursue a course of study requiring two collegiate years of nine months each, during which time he is given an amount of work sufficient fully to occupy his time. An entrance examination is required on all the branches usually taught in a good high school. A systematic course of laboratory work, including qualitative and quantitative analysis, toxicology, urine analysis, as well as drill in the preparation of pharmaceutical products, and in dispensing, forms the most important

feature in the requirements of this school. In no other college of pharmacy is the same amount of laboratory practice required. In very few, if any, has the student an opportunity, even if he desires it, to pursue laboratory work to any such extent. In some schools where there is a nominal requirement of laboratory work, perhaps as much as thirteen days—about all that is really required is the fee.

In the University the laboratory instruction holds the first place in importance. The didactic teaching is shaped so as to give effect to the object lessons of the laboratory. The student is provided with every facility for work, and with every necessary aid in the form of individual instruction, but he must work out for himself each practical problem, and each fact is impressed on his mind with the vividness that only practical illustration can give. The amount and the variety of the work required of the student impressed itself strongly on your committee as it passed from one room to another, finding each crowded to its full capacity with young men and young women, all earnestly at work, and all provided with every requirement for carrying out successfully the particular work before them.

The student is required to pursue his laboratory work in a certain definite order of sequence. Those who have had any experience in trying to guide the studies of the young know how difficult it is to restrain their impatience to reach practical results; the patient preliminary drill essential to success they will endeavor to escape if possible. The wisdom of the rigid rule which makes necessary the completion of elementary work before the more difficult "practical" part is undertaken, is seen at once in the intelligent manner in which the advanced student evidently pursues his work.

The course in urine analysis is particularly full, and is one calculated to be of much value to the young pharmacist. Physicians have little time to devote to the details of this kind of work, of which they must, however, do more or less, unless they can turn it over to a competent chemist. The student is therefore carefully drilled in practical work in this field. He is furnished with a good microscope, and is required to make full reports on a large number of specimens of pathological urine. The use and care of the microscope are also taught him in connection with his work in micro-botanical analysis of drugs.

Full details of the course of study laid down for the candidate for a degree in the department of pharmacy will be found in the announcement of the school, and need not be entered into in the present report except for the sake of comparing the college with others. Your committee has endeavored to obtain the data on which to base some such comparisons. It finds in the first place that the University school set the example of establishing a graded course of study. It had been customary in pharmaceutical colleges to give the same lectures to both junior and senior students, as was the practice also in the medical colleges until within a few years.

The Michigan school does not confer the degree of graduate in pharmacy, which is commonly given in schools of pharmacy. It does not require a prolonged experience in the business of pharmacy as a requirement for graduation, as is the case in most of the schools. In this particular its course has been severely criticised by some. According to the old traditions the art of pharmacy can be learned only by a protracted apprenticeship in a drug store. Americans, however, are little bound by traditions which are based on conditions that have long since changed. At the present day there would seem to be no particular reason why a druggist should require years of practice to acquire skill in the art of dispensing drugs. The fashions of the day change so rapidly that skill so slowly acquired can be of little utility. Improvements are almost daily introduced in modes of manipulation, and in the appliances by which labor is lessened, and the ends sought are more speedily reached. The training a man needs in these days is especially in the art of forgetting. and this is the last thing one could learn under the old routine,

On the other hand the modern pharmacist must be a man of education. must be a constant student and reader to keep up with the times, and must have a training in the critical examination of drugs, preparations, and chemicals (which he now purchases instead of manufacturing) that in the last generation was not necessary. There is hardly anything required of the pharmacist, save purely business experience, for which a rigorous course of study, combined with manipulative practice, does not furnish the very best discipline. Above all things the dispenser of poisonous drugs must be habitually careful. That he should ever substitute morphine for quinine should be an absolute impossibility. He may guard himself by artificial checks as much as he likes, he never will be a safe dispenser if he is not deliberate, methodical, and purposeful in every thing he does. Habitual absence of mind is a characteristic which he can hardly hope to correct, either by drill in college or by years of practice behind the counter. The apprentice who has such a habit is not likely long to retain his place; the student may go on and secure his diploma in spite of such a fault. This is the only advantage, as it seems to your committee, in the required apprenticeship, and this is counterbalanced by the disadvantage that under apprenticeship one is apt to learn an antiquated routine of work, while the school supplies him with suggestions of improved methods and makes him familiar with late inventions. The varied work given the student in the educational laboratory should be the very best preparation for the practice of pharmacy, regarded purely as an art. There is acquired habitual attention to minute details, and confidence in undertaking processes previously untried, and opportunity is given to develop also resources of ingenuity, which the more conservative spirit of the established drug store does not encourage.

In the judgment of your committee the School of Pharmacy of Michigan University affords the student advantages equal to those supplied by

the best pharmaceutical colleges in the country; its promises to the student in its announcement are more than fulfilled in the laboratory facilities it affords, as well as in the quantity and the quality of the didactic instruction given, and in its admirable system of quizzes and examinations.

The school also affords opportunities for self improvement to such pharmacists as have not enjoyed the advantages of a regular pharmaceutical education. Its doors are open to any one over 19 years of age who has been engaged two years in the practice of pharmacy; such students are not required to pass any preliminary examination unless they intend to appear as candidates for a diploma. They pay the usual fees and may attend one or two courses of lectures with the same laboratory privileges as the ordinary students, enjoying the same opportunities also of pursuing study in some other department of the University, if, in the judgment of the faculty, their time will permit. By taking a course of one year's study the druggist may, in this way, avail himself of courses of lectures on general chemistry, on pharmacy, on sanitary science, with laboratory practice in qualitative chemistry, in pharmaceutical manipulation, and in pharmacognosy.

Your committee were invited by the members of the faculty of the pharmacy school to a conference, in which the history, prospects, and needs of the school were discussed. Many questions present themselves in the conduct of such a school which admit of difference of judgment. One of these at the present time is the advisability of conferring a degree of graduate in pharmacy, requiring as conditions a certain amount of experience in the drug store, and not demanding of the student so complete a course of laboratory training. The faculty has not hitherto deemed this expedient, regarding it as important that the reputation of the school for a high grade of scholarship be maintained, and believing that those who really value the instruction offered by the University rather than the name of having its diploma would be as strongly attached as they would be if they were allowed to bear the name of graduate in pharmacy, and that for any other class the course would be worth as little as it was esteemed, while the reputation of the school would suffer from its relation to such a class.

These views were not held dogmatically, and an expression was asked of the committee as representative of the sentiment of the Association in the matter. While disclaiming any responsibility as representatives, your committee approved the policy that has been hitherto pursued. It is probably known to members of this Association that there is still in the Eastern States a prejudice in favor of the old plan of instruction requiring actual apprenticeships in the drug store, and that the University school has suffered in consequence, its graduates not being recognized as on a par with those of the colleges of the old school. It seems important now that the University maintain unflinchingly its ground, leaving it for the superior training of its graduates to demonstrate, as it must, that

its degree is of higher, and not lower, value than the Ph. G. of its rivals. As regards the needs of the school much might be said. It is evident that its vigorous growth must soon render necessary additional facilities for instruction.

Your committee cannot but feel that in affording such advantages as we have described at a nominal expense to all of whatever sex or age (over 16), or nationality, almost without discrimination, they are too liberal. The advantages of an education, particularly one which qualifies its possessor for a remunerative calling, are so thoroughly appreciated that the deserving are more than willing to pay for them. This must be more and more true as the years go on; meanwhile, the State is at a considerable expense to provide these advantages, and is indeed unable to provide them as fully as it desires. The school of pharmacy has outgrown already its present quarters, and needs money to enable it to expand. If the fees of the University were doubled its education would, after all, be given for nothing after the expenses of the school were paid, and no very generous provision would be made even then for the salaries of teachers.

Of course it is true that the student counts the expense of his education closely, and balances the arguments in favor of different schools with a preponderance of inclination to the cheaper school. A difference of a few dollars will ofter decide him to go to another State, when his own offers him superior advantages save for the cost. This is the argument in favor of making our school as nearly as possible free—with the idea that, even at considerable sacrifice, we should make our State independent of others in its educational resources. The State having opened its hand to provide educational facilities its liberality ought to be unstinted, but for this we cannot hope.

As an Association it is possible for us to manifest our interest in the success of the University school in many ways, not appealing too strongly to the pocket.

In other States alumni of various colleges are making liberal donations to their alma maters. The School of Pharmacy of the University does not as yet number very many alumni, and certainly not very many wealthy ones, it is not as yet old enough for that. But pharmaceutical education, as embodied in this school, has merited something at the hands of those of us who are not her alumni, in that it has rendered possible such an organization as our State Association, and has been influential in helping us to secure our pharmacy law. Would it not be possible for those who share in this feeling of obligation to give substantial expression of it by uniting to provide a scholarship fund, or to endow a chair in the school? If this is too much to hope, there remains at least the possibility of cherishing towards the University school a feeling of loyalty that shall find expression on all occasions, influencing by insensible degrees not only assistants and apprentices who may become candidates for the degree of the school, but the public sentiment which finds

its echo in legislative action, and even in the policy of the Board of Regents of the University.

In conclusion your committee desires to express its grateful acknowledgment of the courteous attention paid its members on the occasion of its visit to the school, and its confident hope that continued friendly relations between the Association and the school may be productive of much mutual profit.

Respectfully submitted,

A. B. LYONS, FRANK WELLS, A. B. STEVENS,

October 8, 1886.

Committee.

THE PRESIDENT—You have heard this admirable report on the School of Pharmacy. What is your pleasure with regard to the same?

Mr. JESSON—I move that the report be accepted and adopted, and the committee discharged. Carried.

THE PRESIDENT—The report of the Committee on Liquor License is next in order.

Mr. Jesson—That committee has no report. We started out to do a good deal of work in the early part of the season, and addressed several letters to some of our Michigan Congressmen, to all of which we received the same reply, that commenced by saying: At Washington nothing can be done for you unless we tack it on as an amendment to the tariff bill." The tariff bill didn't materialize, and consequently it dropped. We have nothing to report.

THE PRESIDENT—You have heard the verbal report of the committee with regard to liquor license. Will you take any action thereon? I presume, it being a verbal report, and with no definite recommendations, it is not necessary to take action upon it. We will now listen to the report of the Secretary.

The Secretary read his report as follows:

SECRETARY'S REPORT.

To the Officers and Members of the Michigan State Pharmaceutical Association:

Your Secretary respectfully submits the following report for the year 1885 and 1886.

Since adjournment in Detroit last October the life of the Association has been quiet and uneventful, the Pharmacy Act having become a law through our efforts. No special work has been before us.

At the close of the last meeting we numbered 694 active and honorary members. Since that time we have lost two members by death—Mr. W. L. Hyde, of Marshall, and Mr. W. S. Andrus, of Utica,—and two have withdrawn, leaving us 690 members.

During the past three months the State has been thoroughly canvassed for new members. The wholesale druggists kindly consented to send out notices with application blanks to their customers, urging them to join the Association. Besides this, I have mailed to every pharmacist and assistant in the State a copy of the programme for the present meeting, asking them to join, and enclosing a blank for application to membership. As the result of this work we have received 102 applications, making our present membership 792, so that we are the largest, although one of the youngest of the State Associations.

The publication of the report of the last meeting was delayed until late in the spring. One thousand copies were issued, and a volume sent to every member of the Association. Complimentary copies were mailed to the various State Associations, schools of pharmacy, public libraries, etc. In return we have received the proceedings of many other State Associations.

The total cost of the proceedings was \$319.70; we received from advertisements \$175.00, leaving a net cost to the Association of \$144.70, being less than half the cost of proceedings of other associations of equal size, and notwithstanding this slight cost to the Association, nothing has been sacrificed in the appearance of the volume, and it will compare favorably with the best reports of other associations.

For the correspondence of the year, mailing proceedings, etc., we have used \$81.62 worth of stamps.

We have received regularly complimentary copies of the "Druggists' Circular" and the "Michigan Tradesman."

1885.			CASH RECEIVED.		
Oct.	······································				
	29.		nembership fees, certificates, and dues	731	00
	29.		dvertisements	155	
			1		
1885.			CASH PAID.	\	•
Oct.	13.	To Wm		\$ 139	00
••••	14.	11 11	" "	83	
	20.	16 11	4. 44	81	
Dec.	8.	** **	46 46	12	
1886.			***************************************	14	U.
June	12.	"	46 44	70	00
0 440	21.	"	44	40	
	26.	** **	44 46		00
	15.	** **	44 44		00
Sept.	10.	" "	66 66		15
Oct.	7.			825	
Oct.	11.				65
	11.	Tota			05
m			d	\$089	w
		ollowing	g orders have been drawn:		
Oct.	15.	No. 1.	Geo. Gundrum, expenses	2 8	50
OC.	15.	2.	W. H. Keeler, expenses	•	15
	15.	2. 3.	H. J. Brown, expenses.		00
	15. 15.	0. 4.			
			A. W. Allen, salary		00
N 7	15.	5.	Jacob Jesson		35
Nov.	9.	6. ~	John Owen, rent		00
	9.	7.	James Burns estate, rent		00
	9.	8.	T. W. Palmer, rent		00
	9.	9.	Aldine Printing Company, printing		75
_	14.	10.	Herschel Whittaker, report		00
Dec.	4.	11.	Calvert Lithographing Co., certificates	10	
•	4.	12.	S. E. Parkill, postage, etc.	12	
1886.	4.	13.	Frank Wells, expenses	49	50
Jan.	2.	14.	Times Printing Co	4	25
	2.	15.	H. J. Brown, engrossing certificates	51	00
	7.	16.	C. J. Johnson, electrotypes	18	00
	29 .	17.	W. F. Halliday, cylinders for certificates		50
Feb.	25.	18.	J. H. Champion & Co., printing	100	
March		19.	C. J. Johnson, correcting certificates	_	50
g _{am} ,	19. 7.	20. 21.	H. J. Brown, engrossing certificates S. E. Parkill, postage, etc	51	00 15
Sept.	7. 7.	21. 22.	J. H. Champion & Co., printing	256	
Oct.	11.	22. 23.	S. E. Parkill, postage, etc.		65
			d		67
		100	STANLEY E. PARKILL, Secre		٠.
			~		

THE PRESIDENT—You have heard the report of the Secretary. I believe there is a regular order that it be referred to the Executive Committee without motion. The report will go to the Executive Committee to be examined and reported upon later. The next thing in order is the report of the Treasurer.

The Treasurer then presented his report as follows:

TREASURER'S REPORT.

		RECEIPTS.	
1880	i.		
Oct.	14.	To balance on hand	\$480 05
	14.	To cash)
	14.	" " 88 00)
	21.	" " 81 00	J
Dec. 1886	9.	" " … 12 52	l
June	15.	" " 70 00)
	21.	" " 40 00)
	26 .	" " … 10 00	
Aug.	16.	" " 15 00)
Sept.	11.	" " 51 15	į
Oct.	8.	" " 325 63	;
	8.	" " 84 65	í
	8.	" " 30 05	892 00
		Total	\$1,872 05

DISBURSEMENTS.

1880).					
Oct	15.	By	paid	Jacob Jesson \$	1	3 5
	15.	••	**	H. J. Brown	8	00
	16 .	**	"	Geo. Gundrum	8	50
	21.	**	"	W. H. Keeler	5	15
	27.	44	**	A. W. Allen	50	00
Nov.	12.	• •	"	John Owen	25	00
	12.	**	**	James Burns	25	00
	12.	••	"	T. W. Palmer	90	00
	12.	"	••	Aldine Printing Co	1	75
	17.	4.4	**	H. Whitaker	50	00
Dec.	9.	"	••	Calvert Lithographing Co	10	00
	9.	"	• •	S. E. Parkill	12	52
	9.	"	"	Frank Wells	49	50

1886.								
Jan.	6.	By	paid	H. J. Brown	\$ 51	00		
	6.	"		Times Printing Co	4	25		
	11.	"	**	Charles J. Johnson	18	00		
Feb.	5.	"	"	W. P. Holliday	2	50		
March	2.	"			100	00		
	17.	"	"	Charles J. Johnson	1	50		
	23.	**		H. J. Brown	2	00		
Sept.	11.	"	**	S. E. Parkill	51	15		
_	11.	**	"	J. H. Champion & Co	256	85		
Oct.	11.	"	**	S. E. Parkill	34	65	\$ 8 5 3	67
	11.	То	balaı	nce on hand			518	
			Total				\$1,872	05

RECAPITULATION.

RECEIPTS.

1865						
Oct.	14.	To balance on hand	\$480	05		
	14.	To cash received since				
					\$1,372	05
		DISBURSEMENTS.				
1886						

Respectfully submitted.

Oct.

WM. DUPONT, Treasurer.

\$1,872 05

THE PRESIDENT—This report will also be referred to the Executive Committee.

Mr. Jesson—There is one item, I think, the Executive Committee overlooked in making out the programme, that is, the report of the delegate to the National Wholesale Druggists' Association.

THE PRESIDENT—We shall be pleased to hear the report of the delegate to the National Druggists' Association.

Mr. Wells read his report as follows:

REPORT OF DELEGATE TO NATIONAL WHOLESALE DRUG-GISTS' ASSOCIATION.

To the President of the Michigan State Pharmaceutical Association:

Having attended the meeting of the Wholesale Druggists' Association, held in Philadelphia last October, as a delegate from the Michigan State Pharmaceutical Association, I desire to submit the following report:

I was introduced to the Association during the evening session of the first day by Mr. C. H. Hinchman, and was welcomed most cordially by the President and the members. In response to an invitation to address the meeting, I briefly stated that the object of my appearance among them was to represent a young, but remarkably vigorous Association of retail pharmacists, connected with them by strong business interests. That this Association hoped by complying with their invitation to send a delegate to their meeting to still further strengthen those interests, and to make them in the highest degree profitable and pleasant to the members of both Associations.

I expressed the wish that by means of mutual representation, a prompt consideration of questions concerning business methods affecting both classes, likely to arise, might be had, and a settlement of such questions speedily and satisfactorily reached.

My remarks were received with evidences of cordial approval, and many members expressed to me personally their recognition of the importance of each body sending delegates to the other, as a means of establishing that fraternal relation which should exist between men occupying the positions of wholesalers and retailers of the same goods. The sessions of the Association were well attended by a remarkably intelligent and shrewd class of business men. The debates, conducted in an informal manner, were interesting, and most of the subjects discussed had a greater or less bearing upon the interests of the, retail trade. Among them were those of fire insurance, the rules governing the rebate plan of selling proprietary goods, limits of credit, cash discounts, the propriety of diminishing the number, or of discontinuing entirely traveling salesmen, and charges for boxing and cartage.

A very interesting and valuable report was made by Mr. T. H. Hinchman, chairman of a committee appointed at the previous annual meeting to consider the subject of insurance of wholesale drug stores.

The facts and conclusions of this report will apply with nearly equal force to retail, as to wholesale drug stores. The impossibility of obtaining from insurance companies statistics of losses by fire on drug stocks, and the consequent necessity of basing opinions upon reports of fire departments in States having such departments, was shown. From this source it was learned that the percentage of losses to premiums, range from thirteen per cent. to seventy-three per cent., except in Florida, in which State it exceeds one hundred per cent.

In 1883, this report states: Fire losses throughout the United States were forty-nine per cent. of premiums paid, and that in this year rates were generally and largely advanced. This disproportion of losses to premiums is a necessary outgrowth of large salaries paid by most insurance companies to prominent officers, in whose interest, rather than that of the insured or stockholders, the business is conducted.

In localities where good insurance can be had outside the monopolies, known as insurance boards, lower rates have been obtained, resulting, in some instances, in reductions of board rates. This relief is usually only temporary, the pressure of the organization being generally too strong for the outside companies to resist very long. Many successful mutual companies are instanced. Among them fifty-one Farmers' Companies, and ten others in Michigan. The cost of insurance in these is about eighteen cents on each \$100. There are also nineteen Factory Mutual Companies in Massachusetts, Rhode Island, and Pennsylvania, all doing a prosperous business, and furnishing cheap and safe insurance to their patrons. The first of these was organized in 1835, and the last in 1881. Their profits, during this period, have been sixty-four per cent., and they have furnished insurance at about thirty-two cents on each \$100 insured. The millers of the northwest, it states, have become interested in the subject, and their organization will probably take steps to furnish its members with insurance on the mutual plan. Mr. Hinchman's report justly concludes that, "with the figures furnished it is unnecessary to present arguments," and recommends the Association to take prompt The debate upon this subject showed a general measures for action, feeling of indignation at the action of insurance companies in combining to advance prices and secure their uniformity, thus making competition impossible.

A committee was promply appointed to report a plan for mutual insurance at the next meeting. This subject concerns us, equally with our wholesale brethren.

If mutual insurance can be made profitable to them, there seems no good reason why it may not be made profitable to us. Other State Associations are considering the question, and there seems good reason why we should do the same. The relatively higher rates charged by insurance companies upon drug stocks is certainly unjust, if, as it is now claimed, they do not take fire oftener than other stocks, while the salvage when they do, is no less.

The Association devoted a large amount of time in considering the system known as the rebate plan. Its history, methods, and scope were debated, and all expressed themselves pleased with its successful working and the number of proprietors who had adopted it. Only one firm of dealers, Lord, Owen & Co. of Chicago, were accused of violating its provisions, and, as they claimed to have acted ignorantly, they were told "to go and sin no more." Some wicked retail druggists of Boston, however, did not get off so easily. These had, contrary to the statutes made and provided

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by the proprietors and jobbers, organized a joint stock company, and purchased proprietary goods in quantities entitling them, under the rebate plan, to the jobbers' discount. The goods so purchased were sold to members of the organization at ordinary wholesale prices, and at stated intervals the profits of the business were divided among the stockholders. The amount of stock subscribed and paid for by each member was small and his profits, as the expenses were trifling, were very good. These facts were announced by a member who indignantly resented this infringement of what he seemed to regard as a vested right of jobbers. It is now in its inception, this member declared, and the Association should take immediate and effectual means to squelch it. Continuing, he stated that a similar company was formed in the State of Maine, and that unless measures were adopted for preventing the evil it was likely to spread until it enveloped the whole United States. A stranger hearing the language used on this occasion, and not knowing to what it referred, would have regarded the meeting as a sanitary convention devising means to stamp out the cattle plague or some other infectious disease. Association promptly passed the following resolution:

Resolved, That the National Wholesale Druggists' Association condemn the practice of combinations of retailers who, by such association, purchase of manufacturers the necessary amount of their medicines at the wholesale rates and then, at stated periods, divide profits arising, thus indirectly violating both the spirit and intent of the contract plan, and we ask proprietary manufacturers to decline to fill any orders received from such combinations.

It is difficult to imagine how manufacturers can refuse to furnish their products to business corporations which comply with all the terms the manufacturers dictate, for the sole reason that members of such corporation are retail druggists. Doubtless proprietors have the power, if they choose to exercise it arbitrarily, not only to dictate prices and terms, but also to select the parties to whom they will sell. That they will favor the jobber instead of the retailer, whose good will is of paramount importance in the distribution of their wares, should an emergency arise requiring them to choose between these two classes, is very doubtful. The rebate plan gives to the wholesale dealer a liberal and assured profit. He is made a partaker in the gains of a huge monopoly, and he resents any interference with an arrangement it is so largely to his interest to preserve.

A combination of insurance companies, fixing rates and perfecting methods which destroys competition and makes their business profitable, he denounces, and seeks to evade its effect upon him by a counter combination. 'He passes resolutions against the great evils of railroad pools, another style of combination which unfavorably affects his business. In fact he associates with his brethren almost solely to resist the encroachments of unfriendly combinations, and to form and profit by combinations which are friendly. The wholesale druggist is no exception among business men for exhibiting these characteristics.

Let us consider, before we blame him too severely, if the fault, presuming there is a fault, is not rather in the system than with those who use and profit by it.

Combinations for protection and for self interest, are a marked peculiarity of our age. They are increasing with such extraordinary rapidity that economists have scarcely had time to consider the effect they must have upon business and society. We all realize that nearly everything pertaining to the drug trade and its more common branches, are influenced already by this cause, and that new articles are being constantly added to the list. Associations of manufacturers already control substantially such important products as alcohol, glassware, white lead, linseed and petroleum oils, the long list of proprietary medicines and other goods, and a large proportion of the chemicals and pharmaceutical compounds, such as fluid extracts, pills, etc., which compose the bulk of the drug trade. Not only the lowest prices at which all these must be sold is dictated, but in some instances the output is limited. In other trades a similar condition exists. Combinations among manufacturers have been followed or preceded by combinations among jobbers, but nearly always an understanding between these two classes has been reached, whereby their mutual interests have been conserved, frequently at the expense of the retailer, and always at that of the public.

Retailers, especially retail druggists, have increased so rapidly that they have become sharp competitors with each other in many localities. The feeling engendered thereby, together with their great number, have prevented combinations among them not only, but these causes have often led them to resort to questionable methods, in order to secure a living business.

With cutters of prices in their own midst, physicians preparing their now prescriptions from materials furnished by the same jobbers and manufacturers from whom retailers obtain their supplies and at the same prices, there seems danger that the latter may be crushed between the upper millstone of combination and the nether one of competition. Causes which tend to a reduction of profits of retail druggists are slow in their action, but they are sure. What movement upon our part will most effectually counteract these causes, is a question worth considering. It seems to me that eventually it will become an imperative necessity that retailers shall combine for protection in the same manner that producers and jobbers do. The difficulties in the way of perfecting an organization, which shall, through co-operation and other means, secure the stability of prices, and place our profession in a more independent condition, are certainly great, but they are not insurmountable. State organizations are a step in this direction, and may be made to furnish the power for a system of machinery, which will go far towards the accomplishment of this result. The pharmacy law is likely to become a powerful auxiliary in this work, as it gradually eliminates from our ranks the incompetent, and to this extent at least, diminishes competition. That the business

conditions we have been considering are temporary in their nature, seems probable. However much we may differ as to their causes, I think most of us will admit that the ills they produce are likely to work their own cure in time. The well known laws which have governed business in the past must prevail, and the artificial fabric of combination, now being so rapidly reared, must eventually meet the fate of all structures whose foundations are faulty. This event will be hastened rather than retarded by all trades and occupations combining to secure each for itself, by any legitimate means, its highest material interests. Retailers in the large cities are likely to take the lead in movements in this direction, and there are indications that they are already doing so. Proprietary goods will naturally be the first to be affected, especially such as yield the least profit, either through competition by merchants outside the drug trade. or through the action of proprietors. If found successful in these, cooperation and other agencies are likely to be made to apply to a continually extending range of pharmaceutical merchandise. The power of a large aggregation of men, like the Michigan State Pharmaceutical Association. should it be properly directed, would go far towards securing for its members that just compensation for professional knowledge and long hours of labor so many of its members fail to procure. That the first law of nature, self preservation, may require that this power shall be invoked sometime, appears to me to be justified by the present outlook. Though the views here expressed may seem out of place in this report, I present them because they are those which this meeting of manufacturers and jobbers to whom we are so closely allied. developed in my mind. I would advise nothing, certainly, that should render this alliance less close, or the friendly feelings expressed by each towards the other less strong, but I would stimulate a disposition to use all honorable means and methods to improve and elevate our condition. Much may be done in this direction by the formation of local societies. These, by securing the maintenance of fair prices, the manufacture of a reliable class of popular medicines and toilet goods, in the purchase of certain classes of goods in large quantities and in other ways may add largely to the profits of their members and become nuclei for the formation of more extensive organizations.

I received many assurances that the Association was opposed to their members selling goods at retail, and that they would cheerfully take any action in their power to prevent such sales. I was assured that any specific act of this kind brought to their notice and supported by evidence would receive prompt attention. I believe they are sincere and that this evil may be checked by reporting parties guilty of this practice to the Association.

I will not take up any more time in presenting other subjects discussed at this meeting. The entertainments were on a scale commensurate with the wealth, social position and well known hospitality of the city of brotherly love and quinine, and were most heartily enjoyed.

Accompanied by Mr. Engelhard, of the Western *Druggist*, I had the privilege of inspecting the finely equipped school of pharmacy of Philadelphia. For this we were indebted to the kindly attention of Prof. J. P. Remington, whose name is familiar to you all as one of the revisers of the United States Dispensatory, and whose recent book, Practice of Pharmacy, is one of the most valuable contributions to pharmaceutical literature of our time.

THE PRESIDENT—You have heard this report from our delegate to the National Wholesale Druggists' Association, what is your pleasure with regard to it?

Mr. Jesson-I move that the report be accepted.

Carried.

THE SECRETARY—I have here four applications which the Executive Committee have passed upon.

THE PRESIDENT—We will listen to the names.

THE SECRETARY—They are E. S. Botsford, Dorr; J. L. Norris, Casnovia; A. Parker, Balch; M. V. Wilson, Sand Lake.

The Secretary was instructed to cast the ballot of the Association for the applicants and they were declared elected.

THE PRESIDENT—I would like to inquire if we have present with us any delegates from other associations? We will be glad to hear from them if they will make themselves known.

THE SECRETARY—We have with us two members of our Association who were delegates to State Associations, Mr. Hibbard, who attended the Wisconsin meeting, and Mr. Lyman, who was present at the Illinois Association.

THE PRESIDENT—We will listen to the reports of the delegates.

Mr. Hibbard—Mr. President, I really had hopes of escaping making any report. I have no report to make. Up to the time I came here yesterday I hadn't an idea that I was expected to make a report any more than I had an idea of what was expected of me as a delegate. Where ignorance is bliss, it is folly to be wise. When I started to Wisconsin I was utterly ignorant of what I was expected to do, but if a narration of the incidents of my trip will be of interest to you, if you will give me a moment's attention, I will narrate them in my homely style.

You will remember that a year ago, in Detroit, at our meeting, I was called away on the second day of the meeting by a telegram from Sturgis telling me of my mother's death. After I had gone, I was appointed a delegate to Wisconsin. don't know to whom I am to give thanks for the attention paid When I ascertained I had been appointed as a delegate, I tried to ascertain what was expected of me as a delegate. only information I got was: "Nothing in particular was expected of me, except if I visited Wisconsin I did it at my own I visited Wisconsin. When I started for Wisconsin, I expected, of course, to meet Mr. Kellogg, of Saginaw, and to shift the responsibility of the question upon him. I got on the train and was making my way over there, thinking over what was perhaps expected of me, and I began to feel the responsibility on my shoulders. I hadn't a stove-pipe hat. a swallow-tailed coat. I hadn't the general appearance of a man of fashion, particularly my traveling make-up, and on the other hand, I was not possessed of elecutionary powers to com-In the words of my old farmer father, I was mand attention. not possessed of the "gift of gab" to make myself acceptable to the crowd. Nevertheless, I did the best I could under the circumstances. I didn't expect to make a reputation as an I arrived at Fond du Lac and put my name on the list, and expected to see Mr. Kellogg and invite him to take the responsibility, but I ascertained Mr. Kellogg was not there, but you may imagine my surprise on my name being recognized—I was so careful it should not be-and the Secretary announced that a representative of the Michigan State Pharmaceutical Society was present and would make an address. That was my first intimation that I was to address anybody. I got up without a bit of preparation, and, gentlemen, I think I felt the responsibility of the occasion, only that was not the way the meeting In my feeble endeavor, sir, I made a free-trade speech, or something of the kind, I don't know what it was. All I remember was that I sat down amid the confusion of clapping of hands and stamping of feet, and from that time until I left the city. I was the committee from Michigan, and I went by the name of "Michigan." I met with a most cordial reception and was most royally entertained.

I arrived on the second day of the meeting and much of the work had been gone through with, but I took a few notes when anything interested me as an individual, but had I been informed of just what was expected of me, I might probably have taken a great many more. There were some items that interested me. The first thing that came to my notice as I stepped inside of the room, and especially in the exhibit room, was the large number of ladies present. I wish to say here, before I forget it, that I like it better than any place I have seen, where ladies came forth in force and made the meeting successful. They were around every day, and made every stranger feel at home for three days, more so than I have seen at Detroit. I am not saying anything against Grand Rapids here, but I would be glad to see more ladies present. In my experience in the drug trade, I will say here, that the best clerk I ever had in my store was a lady clerk, and that lady was my wife. The first item of business that my attention was particularly called to I feel I would like to have discussed in our own Association. I jotted down the items of things discussed there of general interest at some certain points, and I feel as though I would like to have them discussed here. One topic was the tariff on alcohol. It was discussed at length and resolutions were passed to perfect such plans as would avoid this tax on alcohol and relieve the druggists. Another matter that took my attention was, that the Prohibitionists at Evansville had refused to grant permits to sell to the druggists. They produced their bonds, properly signed, but they were not accepted, and they were refused permits to sell. They went on and did their business as usual, but within a short space of time one of them was arrested and tried and fined for selling without a This matter was discussed at length. He undertook to bring it before the society in order to get some relief in some way, but they decided they could take no action upon the subject. They would have to present it as a matter of common The issue seemed to be, that they had no right to grant him a permit until he produced a proper bond properly signed, and that they were in no sense compelled to give a permit if he did not do it, so they arrested him and fined him for selling without a permit.

Another subject of discussion was the matter of giving to physicians a percentage upon prescriptions. It was discussed at length, and a resolution was passed expelling from the Association any member who should be found to have allowed or have made the practice of allowing a percentage to physicians for their prescription trade. These are the only items I took any particular note of. There were other items but they probably will be brought out in the report. I now thank you for your attention.

THE PRESIDENT—I think our representative has no occasion to make any apology for his experience at Wisconsin. A delegate who can go from Michigan and comport himself in such a way as to be called by that name and be known as "Michigan," has certainly nothing to be ashamed of.

Mr. Hibbard—Perhaps it was owing to the fact that my name was not announced. When I was announced as the delegate from Michigan no name was given.

THE PRESIDENT—Are there any remarks to be made in connection with this report?

Mr. Jesson—There is one point pharmacists are completely carried away with, and something I desire to refute; that is, the false opinion that the reduction of the tax on alcohol will affect the retail trade. When the revenue stamp from patent medicines was removed, the manufacturers of the medicines got the benefit and not the retail trade. Two weeks after the act passed, notices were sent out that there would be no change in the price of the medicines. As far as the retail trade is concerned, if the tax on alcohol is removed, we will have to sell alcohol at about so much less, perhaps, without getting any cheaper alcohol.

Mr. Wells—I think every effort ought to be made by the State Association to endeavor to bring a pressure to bear that will induce Congress to remove that stigma from the drug trade of classing it with the liquor dealers. It is an outrage upon a reputable profession, and then the expense is no inconsiderable matter. It is unjust. That is to say, it is unjust to the mass. There may be some druggists—I am very sure none belong to

the Michigan State Pharmaceutical Association—who ought to pay a tax; not only pay the government tax, but also the local But the large mass of druggists in this State are unjustly taxed by the United States government as liquor dealers. Mr. Jesson just remarked, the reduction of the tax on distilled spirits would not affect us. It is a matter that affects our customers, but the druggist would make the same proportional profit with the tax as it is, as he would if the tax was reduced or removed. I was a member of the committee last year on the President's address, and I think that address recommended the Association to appoint a special committee to cooperate with the committee of the National Retail Druggists' Association to take some action leading to the removal of the federal tax on alcohol. We reported we didn't think it was our place to take any steps in that direction, that if any were taken it should be done by the consumers rather than by the dealers. I will state that in the session of the Wholesale Druggists' Association this was a topic that was discussed. It was a matter the manufacturers were very much interested in. They are desirous of having the tax on alcohol reduced. All the pharmacists that compound proprietary goods are anxious to have the tax reduced, and would use all the efforts in their power to induce the State Associations to use their influence to have the tax reduced or taken off entirely. That is impracticable, though, unless the tax is taken off from all spirits entirely. Some of them proposed that the tax should be taken off from alcohol to be used in the arts and medicinally. I think as far as druggists are concerned, if the proper pressure was brought to bear, they could be benefited by twentyfive dollars which is now exacted from the trade, I consider unjustly. For my part, I deem it practical. If all of our members at this time should go to the men that are now running for Congress in the different districts in this State, they might accomplish something. Go to them and ask them what they will do and see how they stand, and some time, as druggists alone, we might be able to turn the election. I rather think something of the kind should be done here at this meeting. I hardly know in what way the subject could be brought up at this present meeting. This is a matter that is under consideration in our local Association.

THE PRESIDENT—We would like to hear from Mr. A. H. Lyman, of Manistee, who was a delegate to the Illinois State Pharmaceutical Association.

Mr. Lyman—In my experience as a delegate to the Illinois Association, I think I was a good deal in the same fix that Mr. Hibbard was. I hardly knew what was expected of me. Keppert, another delegate, was also with me, and he promised surely that he would be here, and I expected to turn all the responsibility upon him, but I see that he fails to show up, or I have failed to see anything of him. I only wish I could make as good a report as Mr. Hibbard has made. I will say that I had a very hearty welcome and enjoyed the meeting very much, but I have reason to be more proud than ever of our State Association, both in numbers and in every way. There was one thing that struck me as being a good thing there. the appointing of a committee with one member in each county to secure members and work up an interest in the Association, and to do what they could, and to report what they had done to the Association. Though there was not a very large attendance, the meeting being held at Rockwood, in the northern portion of the State, there were some persons who reported having done some work, and others did not. On the whole, the meeting was successful.

THE PRESIDENT—I wish to call the attention of the Association to this beautiful collection of photographs of medicinal plants. We are indebted to Prof. Prescott and Mr. Stevens for bringing them here for your inspection. They add not a little to the appearance of the room, and I hope you will all take occasion and have opportunity to examine them.

Mr. Prescorr—The School of Pharmacy desires to thank the Association for its kindness in appointing a committee to visit the school. It has been a great satisfaction to the school and has been a great benefit to us. I desire also to express the thanks of the school to the members of the committee for the pains they have taken in visiting the school and inquiring into its working and into its purpose and standing in relation to other schools, and especially to the chairman of that committee for the completeness and value of its report.

THE PRESIDENT—If the Executive Committee are now ready we will listen to their report.

Mr. Jesson read the following:

REPORT OF EXECUTIVE COMMITTEE.

To the President and Members of the Michigan State Pharmaceutical Association:

Your committee held a meeting in Grand Rapids on September 1st, for the purpose of making arrangements for this meeting. Three members of the committee, Messrs. Jesson, Peck and Gundrum, were present, as were also our Secretary, Mr. Parkill, and our local Secretary, Mr. White; also Messrs. Tripp, Escott, and some others.

Your committee has carefully examined the books of the Secretary and Treasurer, and found their reports as read by them correct. The proceedings of last year's meeting make a very creditable book. Our membership is now, without a question, the largest in the United States, and we hope that each member will feel it a duty to keep it there, by paying his dues and not allow his membership to lapse. The Association is now, providing it is properly supported in a financial way, in a condition to do some permanent good. There are many abuses to be corrected, and a large Association can do more toward correcting them than an individual.

The Secretary as required filed his bond for \$1,000, which has been approved by your committee.

The salary of the Secretary was not fixed at the last meeting. The Chairman of this committee has had some experience in the amount of work required, and any amount that this Association can afford to pay cannot repay him for his time. We would recommend that he be allowed to draw an order on the Treasurer for two hundred dollars for his last year's services.

Respectfully submitted,

JACOB JESSON, GEORGE GUNDRUM, J. E. PECK, FRANK WELLS, FREDERICK W. R. PERRY. THE PRESIDENT—You have heard the report of the committee, what is your pleasure with regard to it?

Mr. Wells—I move that the report of the committee be accepted and an order drawn on the Treasurer for the amount of two hundred dollars to pay the Secretary for last year's work.

Carried.

THE PRESIDENT—The next business in order is the report of the Committee on Trade Interests. Is the chairman of the Committee on Trade Interests ready to report?

Mr. Bassett—The Committee on Trade Interests have labored under great difficulty, and as the report has been somewhat forestalled by what has already been presented to the meeting, it will not take much of your time. The committee appointed at the last meeting of our Association consisted of the Chairman, Mr. Bassett, Mr. Lacy and Mr. Coman. Six months ago I addressed letters to these gentlemen asking them to make reports from their section. I received an anwer from Mr. Coman, stating that he had been sick, and he would be unable to take any part in it. Mr. Lacy I never heard from, consequently I have not endeavored to make any report to this meeting, but will present such headings as have been brought to my attention since coming here.

I have been requested to call the attention of this Association to the fact that in different parts of the State the druggists are selling white lead, branded as strictly pure white lead, which is not, in fact, strictly pure. That it is in competition with well known brands of white lead that are branded and guaranteed. They ask if this Association can do anything to rectify this fault.

I have also been requested to bring to your attention the fact that our papers in Detroit, so they claim, are guilty of publishing the prices from day to day of the leading drugs. As for instance, quinine, morphine and opium and things of that nature. Druggists from different parts of the State have spoken to me about this. They claim it injures their trade.

These papers are distributed all through the State, dailies and weeklies. People read the gross and net prices, and when they come to the store to buy they bring the paper quoting these prices, and they expect to buy at these prices.

I should think this matter might be adjusted, possibly by this Association requesting the jobbing trade through the State, and particularly in Detroit, to desist from this practice.

Another point that has been brought to my attention is the distribution of sample bottles of medicine free. And, also, in connection with that, the putting up of proprietary medicine in sample bottles to be retailed as low as ten cents. This practice seems to those who have spoken to me on this matter to be injurious to the trade. One gentleman went so far as to tell me that he had, not a customer but a visitor, who claimed she invariably supplied herself with medicine by the use of these sample bottles. He had waited upon her and looked after her wants and given her the goods free. He also with others deprecated the plan of putting up these small ten cent bottles.

Another party has called attention to the fact of the loss in weight in quinine when put up in five ounce cans and allowed to stand any length of time. He stated to me that he had observed the matter carefully, and he found that after allowing a five ounce can of quinine to stand, I think he said six months, there was an exact loss of one-half ounce. He wished me to bring this matter before the Association.

I have also been requested to bring up the subject of local organization.

The question of a mutual fire insurance has also been presented, and seems to have received considerable attention in some parts of the State. I have in my hand a printed slip which I am requested to present, handed to me by Mr. Hibbard, dated Evart, the 29th of March, 1886. It is headed "Grand Rapids Pharmaceutical Society," and has been mailed, as I understand, by Mr. Hibbard, and advertised through the State. It reads as follows:

WHEREAS, We, the undersigned, druggists of the State of Michigan, members in good standing of the Michigan State Pharmaceutical Associa-

tion, desire a reliable home insurance company, and believing that such a company can be formed from among the members of our State Association with a less rate of insurance than we are now paying, and

WHEREAS, We believe a Mutual Insurance Association is the true method to adopt in insurance, therefore,

 ${\it Resolved}$, That we hereby pledge ourselves severally to give it our aid and support.

The committee have been informed, after some inquiry, that in some places in the northern part of our State and the central part of the lower peninsula where the buildings were principally wooden, and some of them brick, they had paid as high as five per cent. for insurance. In some instances it was ten per cent.; that it was not less than five per cent. This, of course, is a serious question. At the first look at the matter it would possibly seem desirable and feasible to organize an Association for insurance, but to my mind, after thinking of it for several days, it seems to me there is almost, if not quite, an insurmountable obstacle in The first thing that meets our mind is, that the amount of insurance carried on these stores is small; consequently the premiums, although the percentage is large, are very small. Then in the attempt to organize an insurance company for the purpose of carrying this insurance, you must have machinery which will entail considerable expense. The larger trade, or the trade in the larger places, are carrying their insurance at quite a reasonable rate; I think not to exceed one and one-half per cent.; I think that is the highest rate. Now the question is, can this thing be organized and carried on at an expense that will off-set the gain? That is, in other words, will you gain enough on these small risks to pay for the expense of organizing and carrying on a company of this kind? Can we find men that will give their time to the organization of this company, either gratituously or at a small pay, and carry it on cheaply enough to make it practicable?

The next point that has been brought to my attention is the retailing of goods by wholesalers during the holidays. The especial points that the parties wish to make in this case are, that in Detroit we have some houses—they are not entirely drug houses—we have houses there that carry lines of fancy goods and travel through the State and sell druggists their goods, and a few days before Christmas they open up their goods which they scatter broadcast through the State, and publish in the papers, which go all over the State, the fact that their stores are open to the public to purchase holiday goods. They display upon their counters and shelves the stock they have left after loading you up, and they sell that stock at retail, I think I am safe in saying, at a price they sold to you wholesale. They held out inducements to you to come to the City of Detroit and buy the goods at those prices. Now there is, unquestionably, an injustice in this, and I gladly present this matter to the Convention and leave it to them.

The next point I have is the revenue license, which you have already discussed somewhat. The facts in the case are, that the druggists in the State of Michigan are paying the general government something like forty thousand dollars a year as internal revenue tax on the sale of spirits. It seems to your committee that this is an injustice and I am ready to say, and I think with reason, that in many cases the profits arising from the sale of spirits in the drug store do not pay for the taking out of the internal revenue stamp, and I, for one, would be glad to see this Association take some action looking towards the abolishing of this tax.

I also have a request, that inquiry be made with regard to the prevailing custom of charges for prescriptions, whether the charges are based upon the cost of the material, or whether the store expenses are considered as a part of the cost; and suggesting that a uniform scale of prices per ounce be adopted and adhered to, as is the case among physicians and in other professions. These, gentlemen, are all of the points that have been brought to my attention.

THE PRESIDENT—You have heard the report of the chairman of the Committee on Trade Interests, what is your pleasure with regard to it?

On motion of Mr. Allen the report was accepted.

THE PRESIDENT—The report is now open for discussion and suggestion.

Mr. Watts—I move we proceed to take up the report item by item, as the chairman has given it to us, and discuss it. Carried.

Mr. Basserr—The first item I have down is the matter of white lead. They claim an injustice in the selling of inferior brands of white lead under labels which lead the buyer to believe it to be pure. I don't think it would be out of place to state that this complaint comes from Jackson.

THE PRESIDENT—Let us hear from some of our Jackson brethren with regard to the matter if they have any remarks to make upon the subject.

A MEMBER—I have heard several of these complaints that the grinders of the white lead, who were not the corroders, were in the habit of imitating as near as possible the packages of brands of lead that are strictly pure, put up by corroders. I understand that several suits have been begun for infringement of the trade mark, but with what results I am not able to say.

Mr. Basserr—I want to call attention to one thing. We all know that strictly pure brands of lead are branded and guaranteed, stating, "This package is guaranteed to contain strictly pure white lead, ground in linseed oil," or words to that effect. This gentleman claims his lead is branded as follows: "The lead in this package is guaranteed to be strictly pure."

Mr. Wells-This matter of the adulteration of white lead is, undoubtedly, something that ought to be taken up by this Association, in connection with the general fact of the adultera-Our laws in this State concerning the tion of goods. adulteration of medicines, and the adulteration of food, It may at some time become etc., are very imperfect. the duty of the Association to consider this subject with a view to legislation. It was a part of the original draft of our pharmacy bill, that restriction should be laid on adulteration, but it was thought best, as it might perhaps conflict with the passage of the bill if submitted in that form, to modify it somewhat. There is perhaps not so much adulteration in medicine, but still enough to make it quite important that our Association consider it when that matter is taken up. The matter of the adulteration of the articles druggists are in the habit of selling would be proper at the present time to take up; but in the matter of the adulteration of white lead, to undertake by any act that we could perform to prevent such adulteration looks wholly futile to me. I don't think there is anything we can do. It is a reprehensible practice, and no respectable pharmacist or druggist would undertake it, and no respectable dealer would undertake to sell it; but I don't think at the present time anything the Association can do will prevent it. Very likely the Association could express its disapprobation of any dealers doing that sort of business.

A MEMBER—I think Mr. Wells is mistaken about the matter of the adulteration clause. I think that was re-incorporated in the pharmacy law. The committee did think they would take it out, but they thought perhaps if they were going to pass the bill, it would be just as well to put it in.

Mr. Wells—I think you are right. I think the matter was discussed and it was taken out, but it was finally added again. There was a very stringent law with regard to adulteration as far as drugs were concerned.

Dr. Prescott-I think such measures should be taken as would give executive force to the law against adulteration, a practical working law, with a provision for officers to carry it into execution. It will be undertaken in this State sometime in It is already being undertaken now in some of the Eastern States, perhaps more in Massachusetts than in any But be it understood, that, aside from the clause in the present pharmacy law, the common law everywhere makes adulteration a misdemeanor. The only trouble is, there is no machinery furnished by the common law to carry it into effect. It is everybody's business and nobody's business to see the law enforced. Still, if suit was brought by some one against a firm or house which should put out something else under the name of white lead, or under any misleading label, designed to make the public believe it was something other than what it was, the court undoubtedly would sustain the action against the party guilty of such misdemeanor under the common law.

Mr. EBERBACH—With regard to adulterations, there is in the pharmacy act a clause covering that question in drugs. Clause eleven states the penalty on the adulteration of drugs and anything in that line, but it does not cover anything in the way of merchandise like paint, and such matters. If this Association would appoint a standing committee upon adulterations, to which any articles which are suspected to be adulterated may be referred to be reported upon at the general meeting of this Association, I think it would go a great ways towards discouraging the different forms of adulteration. Probably a committee might be appointed without any great expense, to have investigations made, in case adulterations are suspected. I think the Association might do some good in that direction.

Dr. Lyons—The question is one of great importance, and the action proposed seems eminently proper. We cannot accomplish very much, it is true, but it seems as though we could accomplish something by a standing committee appointed to report on adulterations, so that all who are interested in respect to adulterations in any particular case, may have some place to go and get authoritative information with regard to the facts in the case. Although it might not be able by any means to cover the whole field, yet something could be done by an annual report stating positively that in such and such instances adulterations had been found. It would have a great moral effect. I move, therefore, that such a committee be appointed by the Association.

THE PRESIDENT—Consisting of how many members?

Mr. Basserr—I support that motion and add to it that the committee shall consist of three members, of which committee Dr. Lyons shall be chairman.

THE PRESIDENT—You have heard the motion, are there any remarks to be made upon the question?

A Member—Does our present pharmacy law require the Pharmacy Board to look after adulterations?

Mr. EBERBACH—Section eleven reads as follows:

"No person shall add to or remove from any drug, medicine, chemical, or pharmaceutical preparation, any ingredient or

material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value or medicinal effect, or which shall alter the nature or composition of such drug, medicine, chemical, or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity or Any person who shall thus wilfully adulterate or alter, or cause to be adulterated or altered, or shall sell or offer for sale, any such drug, medicine, chemical, or pharmaceutical preparation, or any person who shall substitute or cause to be substituted one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. victed, he shall be liable to a fine of not less than ten dollars nor more than one hundred dollars, and for each subsequent offence, a fine of not less than twenty-five dollars nor more than one hundred and fifty dollars.

"On complaint being entered, the Board of Pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulterations, substitutions or alteration, and report upon the result of his investigation; and if said report shall be deemed to justify such action the Board shall duly cause the prosecution of the offender, as provided in this act."

Mr. Wells—I don't think, as I said before, that there is very much adulteration of drugs, with the exception, possibly, of essential oils. As far as the article of white lead is concerned, any one who thinks he has an inferior article of white lead can test it for himself with the blow-pipe, and can see very quickly whether it is pure. It is hardly worth while to have a sample sent to any committee or to the Board of Pharmacy. But I think we ought to have a remedy if the person complaining has sufficient interest in the matter to make the test.

A MEMBER—As an association of pharmacists, we are not here as general dealers. I, for one, am opposed to having anything to do about paints and oils, or anything of that nature. We should confine ourselves to the profession, but not that I am opposed to the appointing of that committee.

Mr. Jesson—Allow me to say a word. The American Pharmaceutical Association has been nearly killed on account of consulting with the professional men, and ignoring the retail dealers. This Association is founded for the representation of trade interests, as well as those strictly of pharmacists. I don't want to see this Association ruined, or made an association of professional men. Our living is made from retailing everything we can sell. There are but a few men in the State who are exclusively pharmacists. There are two or three in Detroit, I believe. If we ignore the trade interests entirely, you will find that our Association will go the same way the American Association came near to going.

A Member—I suppose you are all aware that a majority of our hardware men are also dealers in paints and oils. Could we have any power over the hardware dealers dealing in paints?

Mr. Prescort—The profession of pharmacy is not restricted at the present time to the furnishing of drugs and medicines. The pharmacist deals in articles for the general community, as well as for the medical profession, and certainly the furnishing of such articles as paints and oils requires knowledge and chemical skill. It seems to me it is perfectly proper for this Association to appoint a committee to make inquiries with regard to adulterations and report thereon. Certainly, if Dr. Lyons is willing to take the chairmanship of the committee, I think it would be a useful one.

Mr. EBERBACH—I think the appointment of this committee would be not only a benefit to the ordinary tradesmen, but to the druggists of the State, especially when they are handling goods of that nature. That committee could make some important showings and report to the Board. If there is a committee of that kind, interested members of the Association will naturally refer to that committee such subjects as require their attention, and present the case to them so as to establish some proof for their suspicion.

There being no further remarks upon the subject, the motion was put and carried, and the Association appointed as members of the committee: A. B. Lyons, of Detroit; A. Bassett, of Detroit, and Mr. A. B. Stevens, of Ann Arbor.

Mr. Bassett—The next point is the quotation of the prices of drugs in newspapers outside of trade journals.

Mr. Wells—I move that the Secretary of the Association be requested to ask the wholesale druggists of Detroit to decline to give the daily papers quotations of the price of drugs, and that the wholesale dealers in the State of Michigan be requested to decline to give the newspapers in this State the wholesale quotations of the prices of drugs.

THE PRESIDENT—You have heard the motion, are there any remarks to be made upon the question?

Mr. EBERBACH—The publishing of the price of drugs is of no earthly use to anyone. It happens quite often that parties come in the store with a paper in hand showing the quotations of quinine, morphine and opium and salts by the barrel. I have always looked upon it as an imposition. I don't know that we can dictate to those papers what they shall publish, or what they shall not publish. I think if we should request the wholesale men who have been furnishing quotations to the papers to stop the practice, and request them to speak to the publishers of the papers and get their consent to stop the publication, that we may gain this point. I would like to have it accomplished in a friendly manner, and have them give up the publication voluntarily.

THE PRESIDENT—Do you make that as an amendment to Mr. Wells' motion?

Mr. EBERBACH—I make that amendment.

Mr. Wells—I imagine that the lists are furnished by the wholesale dealers to the newspapers not in the interest of the newspapers, but in the interest of the dealers, or in the supposed interest of the retail trade of the State. I have no doubt that a request of this kind, coming from this Association to the wholesale dealers would have the desired effect.

A MEMBER—It would have more weight if they asked the papers not to publish the quotations.

Mr. Wells—I will accept that amendment to my motion.

THE PRESIDENT—The motion as amended would be this: That this Association instruct the Secretary to request the wholesale dealers to ask the publishers of papers, other than trade journals, not to publish those quotations.

The motion was carried and the Secretary instructed to act accordingly.

Mr. Basserr—The next point is the loss of weight in quinine when put up in five ounce cans, if kept any considerable length of time.

Mr. Wells—If the Association can stop the loss, I move they do so.

Dr. Lyons—It is not a loss of quinine; it is a loss of water of crystallization; unless the quinine is kept in tight packages, it always loses weight on this account. The members of the Association should be familiar with that fact, and keep their quinine in air tight packages, or their margin of profit will be very narrow.

THE PRESIDENT—I think that disposes of that point.

Mr. Basserr—The next topic is the selling to physicians by jobbing and manufacturing houses. I have heard it stated that perhaps this complaint arises more particularly from the fact that houses which manufacture fluid extracts, pills and resinoids and articles of that nature are in the habit of passing through the State and selling to physicians in the smaller towns and even in the larger ones a stock of goods at the same prices they charge the trade, and in many cases, throwing in a lot of free samples.

Mr. Wells—I don't know very much about this myself, but I am informed that by a good many reputable firms, it is a common practice. I think it is wrong. Of course, they have a right to do it, but if they expect the retail trade to sell their products, they will certainly be disappointed in time, if that practice is continued.

Mr. Jesson—Over on the lake shore of Michigan we come directly in contact with a number of manufacturing houses in

Chicago whose agents are in the habit of coming over in that part of the State and soliciting orders from physicians.

Mr. Wells—There seems to be a good deal of feeling upon this subject, and I den't know but we ought to take some action. In order to test the sense of the meeting I move that any member of this Association, to whose knowledge it may come, that manufacturers or wholesale dealers are furnishing to physicians goods at the same price for which they furnish the goods to the retail trade, shall report such facts to the Executive Committee of this Association, and the Executive Committee at the next session of this Association shall report the facts to the Association.

On motion of Mr. Bassett the following amendment was added to the above motion:

That the Executive Committee be instructed to inform any such manufacturer or jobber of the facts which have come to their knowledge, that he is furnishing goods to physicians at wholesale prices, with a view to his desisting from such practice.

The above resolution, together with the amendments thereto, was adopted.

Mr. EBERBACH—I move that a circular be sent out by our Secretary to every manufacturing house that comes in contact with our Michigan druggists, to the effect that they should regard the interests of the retail trade in this State, and protect their interests by making a discrimination in prices in favor of the retail dealer as between the prices given to the retail dealer and those given the physicians.

Carried.

Mr. Basserr—The next point we have on our list is the organization of local societies. It seem to me this can be disposed of by simply passing a resolution that it is the sense of this Association that these societies should be organized in every town of considerable size.

THE PRESIDENT—If the gentleman will allow me I would like to make a suggestion: that is, in some places where the number of druggists is so small that local organizations hardly seem possible, possibly county organizations might be effected. In our place, for instance, I hardly think we could make a success of a local organization, but it seems to me in our own county we could form quite an Association, and we might accomplish some good thereby.

Resolution adopted.

On motion the President was instructed to appoint a committee consisting of one in each county in the State to take the matter of local organization into consideration.

Mr. Basserr—The next topic on the list is that of fire insurance.

Mr. Wells—At the last meeting, held I think last week or the week before, of the Wholesale Druggists' Association, I am told that this question of mutual fire insurance was still further considered; that they expected to perfect an organization among themselves for mutual insurance, but the machinery is not yet perfected, and I think perhaps it would be well for our Association to take a little further time and wait until the Wholesale Druggists' Association have perfected their machinery.

A MEMBER—Do I understand that if they form an organization for that purpose, it would include the retail druggists?

Mr. Wells—It does not include the retail druggist, but we can take their plans. It may be possible, however, that after proper consideration, they may deem the whole scheme impractical.

A Member—If there are any means to relieve the drug trade from this unjust discrimination in the matter of insurance, we certainly ought to consider it and take some action. I know it is an injustice in a great many instances, and I will just relate one instance to show the injustice of the thing which occurred in my own case. I was in a building and was paying at the rate of one and a quarter per cent. They complained that the building was not safe; some of the windows had to be bricked up, etc., and I went on and spent four or five hundred dollars, and the next year I received a benefit in the shape of an addition of ten per cent a year; the addition making one hundred and thirty-

five instead of one hundred and twenty-five cents on a hundred dollars. All my efforts to get that unjust discrimination reduced have been unavailing.

Mr. Gundrum—I will give some experience I have had in insurance. I had been paying eighty cents on a hundred dollars for insurance. The companies got together and they declined to take t at eighty cents. They thought they would have one dollar and twenty-five cents of me. I said to the insurance agent, when it was run out to let it run, I would not take any insurance. In the meantime somebody else came along there in the insurance business, and offered to take it at the old rate, and in a little while the board dropped to eighty cents on a hundred dollars, which is what they have been carrying it for ever since.

Mr. Wells—The injustice of this matter of insurance will be appreciated when the question is thoroughly understood. They have insurance boards throughout the State for the purpose of prescribing rates on every piece of property. They have insurance boards in each one of the districts, and in each district they have one man, usually, who dictates the price at which insurance shall be carried, and, of course, the price is governed by the different whims of the individual agent. If he feels pretty friendly toward a person, he may make the rate pretty low. On the other hand, if he don't feel friendly, he may make it pretty high, or, if he should have an attack of dyspepsia or something of that kind, he may make the rate a great deal higher.

Mr. Jesson—I know of a wooden building in this State whose rate of insurance is fifteen per cent. Some six years ago our firm was paying one dollar and a half on a hundred dollars in a sixth-class wooden building in Muskegon. To-day we are paying one dollar and sixty-five on a hundred dollars in a first-class brick building on the corner.

Mr. Hibbard—I have been interested in the different experiences that have been given, and I will add mine. Ten years ago we were paying a rate of three per cent insurance in our village, at the time our water works were not established. A strong argument in favor of having water works, was that it

would lessen the insurance. Now we have water protection that is not exceeded anywhere in the State, but instead of lessening our insurance, where we paid three per cent., we are at present paying five per cent insurance, and that is in a brick building. People who have been paying one and one half per cent on their property do not realize what it is to pay five per cent. I move that the Committee on Trade Interests be instructed to confer with the Committee on Insurance of the Wholesale Druggists' and report at our next meeting.

Motion carried.

Mr. Basserr—The next topic is the twenty-five dollar revenue license imposed upon retail druggists.

Mr. Wells-I move it be discontinued.

This matter having been already discussed at length, no further discussion was thought advisable at this time.

Mr. Bassett—The next topic is in relation to the prices charged for prescriptions in different portions of the State, whether it is based on the cost of the material or size of the package.

Mr. Wells—I will base it on the cost of the material, if the material is very low.

Mr. Basserr—I might say that the gentleman who presented this, Mr. Hayward, stated that in their locality they had been in the habit of charging according to the cost, and in some places they have based their prices upon the size of the package.

THE PRESIDENT—It occurs to me that this question could be more properly regulated by the local societies. It does not occur to me that this Association can very well undertake to establish a schedule of prices for prescriptions for every part of the State.

Miss Locker—I would like to say just one word. We very often have a customer come in who calls for a simple drug—perhaps a drachm of potassium bromide, and I put it up. If I charge the intrinsic value of the drug, they will look around and say: "Did you put it up right?" I tell them I think I have. "Well, I supposed it would cost more than that." So,

when I have such a customer as that, the first thing I do is to size him up and charge accordingly.

Mr. Basserr—The next subject is the paying of a percentage upon prescriptions.

A MEMBER—That is a matter we have had up before and taken some action upon it. Mr. Wells, in his address two years ago condemned the practice, and the committee on the address reported its opinion that such practice ought to be condemned. I think we are on record already upon that question.

THE SECRETARY—I have a few more applications for membership that have been passed upon by the Executive Committee and reported by them favorably: F. E. Kelsey, Ionia; Richard Van Bochove, Grand Rapids; Nelson Pike, Morley.

On motion the Secretary was instructed to east the ballot of the Association for their election.

THE SECRETARY—The ballot is cast and the applicants are elected.

Mr. Wells-There was an amendment to the Constitution proposed at our last meeting. Article 5, Section 1, reads: "The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association, call special meetings at the written request of twenty-five members, shall present at each meeting a report of the Association and perform such other duties as pertain to the office." The words proposed to be inserted are: "Until the close of such meeting." Such words to be inserted after the word "Association" in the third line. That clause will require the President to preside until the close of the meeting, rather than the newly elected President. The old President, of course, has the business in hand and is familiar with the members, and it is of course to be expected that he can perform the duties of the President better than any new man might who had just been inaugurated. I move the adoption of the section as amended.

THE PRESIDENT—It is moved and seconded that the amendment of the Constitution as read, being Article 5 and Section 1, be adopted. The adoption of the amendment requires a

two-thirds vote of the members present. As many as favor the adoption of the amendment will signify it by saying "aye."

Adopted unanimously.

Mr. Warrs—Before we adjourn I wish to call the attention of the Association to the fact that the Secretary's report mentions the death of two members of our Association. It has been the custom of the Association to appoint a committee to present suitable resolutions upon the death of a member. Perhaps it would be wise for us to do that now. The Secretary's report mentions the death of W. L. Hyde, of Marshall, and W. S. Andrus, of Utica.

THE PRESIDENT—It would be well if a motion were made to that effect.

A Member—I move that a committee of three be appointed to draft a suitable memorial of respect for the deceased members. Carried.

THE PRESIDENT—I appoint as such committee Mr. H. G. Watts, F. J. Wurzburg and Mr. William Dupont.

THE PRESIDENT—We will now listen to the report of the Committee on the President's Address.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

To the Michigan State Pharmaceutical Association:

Your special committee to whom was referred the address of President Brown would respectfully report that they have had the same under consideration, and would make the following recommendations:

That so much of the address as refers to a change in our Constitution, article 5, section 3, be not approved.

That so much as refers to the filling of vacancies in committees or any list of delegates, occurring during the recess of this Association, be approved.

That so much as refers to the relations that should exist between physician and pharmacist be approved.

That so much as refers to a change in the By-Law requiring members to sign the Constitution be approved.

That so much as refers to the formation of local societies be approved.

That so much as refers to free samples be referred to the Committee on Trade Interests.

That so much as refers to the printing of jobbing prices of drugs, by the daily papers be referred to the Committee on Trade Interests.

That so much as refers to a national meeting of State Secretaries be approved.

That so much as refers to the red poison label be referred to the Committee on Trade Interests.

That the appointment of Mr. A. B. Stevens a member of the Committee on Unofficinal Formulary be approved.

That so much as refers to the incorporation of the Association be referred to the Committee on Legislation.

In conclusion, gentlemen, your committee find the address full of sound advice and earnest solicitude for the well being of this Association, and the advancement of pharmacy. Many of the suggestions and recommendations are not of a nature to require action by your committee, but every member of this Association will be amply repaid by a careful study of the full address.

All of which is respectfully submitted.

(Signed by)

G. W. CROUTER, CHARLES WRIGHT,

Committee.

THE PRESIDENT—You have heard the report, what is your pleasure concerning it?

Mr. Wells—I move the report be accepted and considered item by item.

Carried.

Dr. Crouter—The first subject is the recommendation that the Constitution be amended authorizing the President to fill vacancies that may occur during his term of office.

Mr. Wells—I move that the Secretary be instructed to draft an amendment conforming to this recommendation for action at our next meeting.

Carried.

Dr. CROUTER—The next topic is the request that the State Medical Society be requested to appoint delegates to our Association.

Mr. Wells—I move that the President be instructed to invite the State Medical Society to send a delegate or more to attend our next annual meeting, and that this Association will be pleased to reciprocate in like manner.

Dr. Crouter—The next recommendation is to appoint a Publication Committee or elect an Assistant Secretary. election of an Assistant Secretary is, in the opinion of your Committee, not necessary, as Article 9 of the By-Laws makes it the duty of the Secretary and Executive Committee to publish annually the proceedings of our meeting. It would seem that six members of our Association are sufficient to perform Article 9 reads: "The proceedings of the Association, the roll of officers, committees and members shall be published annually under the supervision of the Secretary and Executive Committee, and a copy of the proceedings sent to each member of the Association." It seems it is already left in the hands of the Secretary and the Executive Committee, and if they found it too much work for the Secretary, they could engage a man to do the work for them, or it could be done under their supervision, only the law was plain on that subject.

Mr. Jesson—The cause of the delay in publishing our proceedings has been this: We have some papers that the journals are anxious to get, and we have allowed them to have these papers, but they have not been returned in proper time.

Mr. Stevens—Would it not be well to require that the original papers be kept in the hands of the Association and only copies of them be furnished to the journals?

On motion the report of the Committee on the President's Address with reference to the matter of the Assistant Secretary was adopted.

Dr. CROUTER—With respect to the change in By-Law No. 3, we find that the proposed amendment was offered a year ago, at our last meeting, and will become operative at this meeting by a three-fourths vote of the members present.

THE PRESIDENT—Here is the report of the Committee on the Recommendation upon applications hereafter to be made to the Association. The by-law as amended reads as follows:

"The initiation fee shall be one dollar, which fee shall be paid to the Secretary."

Mr. Wells—I move that the amendment to By-Law No. 3 proposed last year be adopted.

Carried.

Dr. Chouter—Your committee approve the recommendation for forming county societies, and trust the recommendation will be adopted.

Mr. Wells—Action on this recommendation is unnecessary, since the Association has already taken action of a similar nature.

Dr. CROUTER—Your committee also approved the recommendation to send the Secretary to the meeting of State Secretaries at the annual meeting of the American Pharmaceutical Association.

THE PRESIDENT—What is to be done with the recommendation?

Mr. Gundrum—It seems to me it ought to include traveling expenses.

THE PRESIDENT—It includes actual traveling expenses.

On motion the recommendation of the committee was adopted.

Dr. CROUTER—The committee also recommend the adoption of the scarlet labels for poisons.

A Member—I move that we take no action in this matter of poison labels.

Carried.

Dr. Chouter—The committee concur in the appointment of Prof. Stevens as a member of the Committee on Unofficial Formulary.

Adopted.

Dr. CROUTER—The committee was not clear—having had no time to look it up—whether we are entitled to a representative

on the committee for revising the United States Pharmacopæia, but if we are entitled to a representative the committee recommend the appointment by the President of a representative to serve on the Committee of Revision.

A MEMBER—It is my opinion that the Association must be incorporated before we are entitled to a representative.

Mr. Wells—The Association will, undoubtedly, be incorporated within the year, and I move that when the Association is incorporated a delegate be appointed by the President.

Carried.

Dr. CROUTER—Your committee also approve the recommendation to instruct the Committee on Legislation to take the proper action to incorporate this Association.

Mr. Wells—I move that this matter be referred to the Committee on Legislation with instructions to procure the incorporation of this body.

Carried.

Upon motion of Mr. Wells the Association adjourned until Thursday at 8 o'clock a. m.

FOURTH SESSION.

THURSDAY, OCTOBER 14, 8 O'CLOCK A. M.

The Association was called to order by the President, who announced the first procedure of the session was the opening of the question box.

Mr. EBERBACH—The first question is: "What is the best drug mill?"

Dr. Prescott—That is a pretty difficult matter to decide. We have used the Swift mill, a hand mill, and the Enterprise mill. I prefer the Enterprise, although the Swift mill is a very good mill.

Mr. EBERBACH—I have a Swift mill, and I like it very much.

Mr. Gundrum—I got a new Swift mill a year ago, and I like it first rate, but I would like to have a horse to run the mill.

Mr. EBERBACH—The next question is: "Would it not be well for us and the people of our State to have the standard of kerosene oil changed from what it is now, to one hundred and twelve degrees, and how can it be done?"

Mr. Wells—I don't think the Association has time to take up that question; it took me a year to study it up; my own opinion is that it is not advisable at present to change the test on kerosene oil.

THE SECRETARY—I have an application for membership from J. L. Strong, of Bessemer, which has been approved by the Executive Committee.

Upon motion the Secretary was instructed to cast the ballot of the Association for the election of the applicant.

Dr. Prescorr—The Committee on Queries have yet a few papers to present.

THE PRESIDENT—How many more papers have you?

Dr. Prescorr—There are but a few I believe. They can be read and approved by title, or can be presented in just such time as the Chair thinks can be afforded for this work.

THE PRESIDENT—We can spend twenty minutes now reading papers.

Dr. Prescott-Dr. Lyons will present a paper.

Dr. Lyons—The paper I will present by title merely. Its subject is "A study of the use of Mayer's reagent in estimating alkaloids."

For paper see subsequent pages.

Dr. Prescott—The next paper is an answer to query 29, "Solid extracts vary greatly in strength. What are the causes of the variations, and how can uniformity be secured?" Accepted by H. W. Snow of Detroit.

Short papers were read in reply to the following queries:
Query 54, "What is the proportion of oxidized mercury in
mercury with chalk?" Accepted by O. C. Johnson of Ann
Arbor.

Query 5, "What is the quality of idoform in use?" Accepted by J. R. Conrads of the School of Pharmacy at the University.

Query 43, "How does the purity of artificial salicylic acid compare with that of the natural?" Accepted by E. A. Ruddmon.

For the above papers see subsequent pages.

Dr. Lyons—Prof. Johnson's paper is of especial interest since it presents in a very strong light the objection which has been already urged against mercurial chalk, especially as a remedy to be prescribed to children. I think the association should take some action by which this matter may be brought once more to the notice of physicians. The substance of the paper ought to be communicated to the prominent medical journals, so that physicians may be informed in regard to the variability, the consequent uncertainty and even danger there is in prescribing it. If a more permanent preparation cannot be devised, they should at least understand the importance of insisting that the article used be always one recently prepared.

Query 45, "What improvement, if any, can be made in the present pharmacopeial preparation of fluid extract of ergot?" Accepted by E. C. Federer of Detroit. The paper is too long to be read in course. Mr. Eberbach will read some extracts from it.

For paper see subsequent pages.

Dr. Prescorr—We have also a valuable paper entitled: "A study of the United States Pharmacopæia method of assaying opium," by T. J. Wrampelmeier and G. Meinert. The authors conclude that the 50 c.c. of filtrate, which we are directed in the U. S. P. process to take, is more nearly correct than the 52 c.c., which Mr. Conroy would have substituted; also that about 10 per cent. of the morphine is retained in the mother liquor after crystallizing by the U. S. P. method.

For paper see subsequent pages.

Mr. Wells—If the Association will indulge me for a moment I will make a statement. Some years ago I took a boy into my employ in the store—a bright boy, one of the best boys I ever

had. He made good progress and became quite an adept in the drug trade, particularly in the professional part of washing bottles and graduates. He left me and entered a larger sphere, but still continued his connection with the drug business. He finally fell from the high position of a druggist and became a member of the Legislature. During the period that he was a member of the Legislature he did admirable work in aiding us in the passage of the Pharmacy Bill. That boy is present here now, and I shall be very glad to introduce him to this Association as a candidate for the next Congress, the Hon. Wilbourne H. Ford of this city.

Mr. Ford—Mr. President and gentlemen of the Michigan State Pharmaceutical Association: I should very much like to address you at some length, because my heart is in the work which you gentlemen are engaged in, but unfortunately I am suffering from a very severe hoarseness—contracted how I will not state—and I can at best say but a very few words. fess I am surprised at the magnitude of this organization; I am informed that the Michigan Pharmaceutical Association is the largest one of its class in the United States. Although I have not been present in the city during your session, I have read of you in the newspapers, and I declare I am more than pleased to learn of the interest taken in this work, not only by the druggists of the State, but by the honorable profession of chemists and pharmacists in the State. It is one thing for a man to belong to an association and take a sort of professional interest in it, but it is quite another thing for him to let his heart go out to it, and take such an interest as a man ought to take. When, at the last session of the Legislature—when I fell from grace, as my friend Wells stated—the Pharmacy Bill was presented I had no question in my own mind of its passage, no question whatever; but, to my astonishment, when the bill became agitated and the time of its passage came on, we were informed of what? That it was "class legislation." I thought it was a joke, I did not think that any man outside of a mad-house could say that a bill to protect the lives of the citizens of Michigan could be called "class legislation," but I found, Mr. President and gentlemen, that was the principal objection urged

against the Pharmacy Bill, notwithstanding it may seem to you absolutely ridiculous and laughable; still, that objection almost defeated the bill. It was all we could do to get it passed. I think it passed by exactly 57 votes, when only 53 were necessary. But it has gone through, and I am glad of it. It will elevate the standard in this State of men who follow that profession, and far from being "class legislation," it is legislation in the interest of all. Gentlemen, I hope you will excuse me from speaking further, my voice is in a bad shape. I thank you, gentlemen, for the attention you have paid me and the honor you have shown me in calling me to address you.

Dr. CROUTER—I have listened with pleasure to the remarks of Mr. Ford, and I wish to bear my personal testimony to the very active and efficient work he did in the Legislature to secure the passage of the Pharmacy Bill.

THE PRESIDENT—The next order is unfinished business. Under that head I believe we should have the report of the delegates to the American Pharmaceutical Association. If Mr. McDonald is present we would be glad to hear from him.

Mr. McDonald not being present the Association proceeded to the next order of business.

Mr. Wurzburg was called to the chair.

Mr. Brown, of Ann Arbor—Mr. President, I wish to present to this Association, and for election as an honorary member of this body, the name of Dr. S. H. Douglass, of Ann Arbor. Perhaps the most of you are aware of the fact that Dr. Douglass was the founder of the School of Pharmacy at Ann Arbor, and was its director for a great many years, and has been closely connected with the work of that school for many years, and I think it would be a grateful act for the Association to elect Dr. Douglass an honorary member, and I move that he be elected.

Mr. Prescorr—I take great pleasure in supporting this motion. It is true that the establishment of the chemical department at the University, and its success certainly for the first twenty years is very largely due to Dr. Douglass, and the careful, prudent and steady hand with which he guided it, and by which he cherished its then slender means and made provisions

whereby it should be supported largely through its own receipts.

The question of the election of Dr. Douglass as an honorary member of the Association was put to a vote, and carried.

THE PRESIDENT—The next order is the report of the Committee on Exhibits.

The report of the committee was read by its Chairman, Mr. Allen.

REPORT OF COMMITTEE ON EXHIBITS.

GRAND RAPIDS, October 14, 1886.

To the President and Members of the Michigan State Pharmaceutical Association:

Your Committee on Exhibits would respectfully report that after making a thorough and careful examination they find the exhibitors to have fallen off in number from last year, but in point of quality surpass anything yet done, and great credit is due the many firms for their efforts, and no little of this is to be credited to our local Secretary, Mr. Will White. The following is a list of the exhibits:

Duroy Wine Co., of Cleveland, O., pure native wines.

Mills, Lacey & Dickinson, of Grand Rapids, Mich., surgeons' supplies in great variety.

Irondequoit Wine Co., of Rochester, N. Y., fine port, sherry and catawba wines.

A. Major, of New York City, cements and liquid glue.

Roper & Baxter Cigar Co., of Chicago, fine line of domestic cigars.

National Cash Register Co., of Dayton, O., cash register.

Heyman & Son., of Grand Rapids, Mich., exhibited a line of their show cases.

Foot & Jenks, of Jackson, Mich., fine perfumes and their new odor "Linden Bloom."

McKesson & Robbins, of New York, a full line of their gelatine coated pills, chemically pure salts and hydrochlorate of cocaine.

Frank Inglis, of Detroit, Mich., exhibits his compound elixir of fir.

John Wyeth & Bro., Philadelphia, fluid extracts, elixirs, hypodermic tablets, compressed medicinal lozenges, and liquid malt extract.

Chesebrough Mfg. Co. of New York, a full line of vaseline and preparations of same.

Seabury & Johnson, of New York, fine display of medicinal plasters, antiseptic dressings and absorbent cotton.

Parke, Davis & Co., Detroit, crude drugs, gelatine capsules, filled and empty, fluid extracts and normal liquids.

Berry Bros., of Detroit, varnishes and gum used for same.

Alabastine Co. of Grand Rapids, Mich., their new product "Anti-Calsomine" and the products of their mine.

Wm. R. Warner & Co., Philadelphia, sugar coated pills and pharmaceutical preparations.

"Acme" White Lead and Color Works, Detroit, liquid paints, white lead in oil and Neal's carriage paint.

Farrand, Williams & Co., Detroit, fluid extracts, and other pharmaceutical preparations, and also a very fine display of rare crude drugs.

Charles Wright & Co., Detroit, non-secret remedies and pharmaceutical products.

G. F. Burton, of Springfield, O., percolating and filtering apparatus.

Chapman, Green & Co., Chicago, make an excellent exhibit of their products, consisting of fluid extracts, sugar coated pills and pharmaceutical preparations.

Dean, Foster & Dawley, Chicago, lettered prescription and cut glassware, and a general line of sundries.

Frederick Stearns & Co., Detroit, pharmaceutical products, perfumes and new positive medications.

Albert M. Todd, Nottawa, Mich., crystal white essential oil of peppermint, pepmenthol.

Eli Lilly & Co., Indianapolis, Ind., fine display of their products, consisting of coated pills, fluid extracts, compressed tablets, syrups and elixirs.

Mallinckrodt Chemical Works, St. Louis, Mo., an excellent and attractive exhibit of their fine chemicals.

H. D. Cushman, Three Rivers, Mich., menthol inhaler and oil of peppermint.

Eastman Bros., of Philadelphia, Pa., exhibit a line of their fine perfume and toilet soaps.

A. W. ALLEN,
JAS. W. CALDWELL,
HENRY HARSWOOD,
G. W. BEAMAN,
S. M. SNOW.

THE PRESIDENT—You have heard the report of the Committee on Exhibits, what is the pleasure of the Association?

Mr. Jesson—I move the report be accepted. Carried.

THE PRESIDENT—Is there anything further under the head of unfinished business?

Mr. Wurzburg—I move that Mr. William S. White, of Grand Rapids, be paid the sum of fifty dollars to reimburse him for his time and expenses in preparing for this meeting.

THE PRESIDENT—You have heard the motion, are there any remarks to be made upon it?

Mr. Wells—I would like to inquire if that is the amount we have been in the habit of paying to our local Secretary for each year.

Mr. Wurzburg—That is the amount we paid in Detroit last year.

Mr. Jesson—The first year the local Secretary didn't receive anything. The second year he was paid fifty dollars.

Mr. Wells—I don't know but that sum is a proper sum. I didn't speak of it because I thought the amount was too much, but I thought it would be well if we had established a precedent to continue it.

Motion carried.

Dr. Lyons—One point, I think, ought to be settled by action of the Society; that is, with regard to the possession of papers. For the last two years, the papers have not been in the hands of the Publication Committee until a very late period. The Secretary of the Association, or at least the Publication Committee, had a great deal of trouble getting track of the papers.

I move that we adopt a resolution that, as the papers presented to this Association are its property, they must be placed in the hands of the Secretary as soon as they shall be called for, but not later than one month after the time of the meeting.

Mr. Stevens—It has been said here once before that the papers are the property of the Association, and I do not believe it is necessary to let the papers go out of the hands of the Secretary. If the journals want the papers for publication in advance, they should have copies made of them. If the papers should any of them be lost, it would be very hard to replace them.

Motion carried.

Dr. Lyons—Another motion I wish to make. For the last two years our published proceedings have been interleaved with advertisements published on various colored papers. They have saved the Society considerable expense, but to me it seems more in good taste to place the advertising matter at the end of the proceedings, and I move that all advertising matter that shall appear in our proceedings hereafter be placed at the end of the volume.

Carried.

After a somewhat lengthy discussion as to the time and place of holding the next meeting, it was decided to hold it at Petoskey, the second Tuesday in July, 1887.

A Member.—Taking in view the proposed meeting at Petoskey, I think it would be a good idea to appoint a Committee on Transportation this year. I think a good deal might be accomplished by having a committee on this subject, and I move that the President appoint a committee of two to take this in charge. Carried.

THE PRESIDENT—I notice our delegate to the American Pharmaceutical Association is present. If it is the pleasure of the Association, I will ask him to make a report. If there is no objection I will ask Mr. McDonald to step forward and make a report.

Mr. McDonald—Mr. President and members of the Association: I believe I was the only member of this Association who

was present at the meeting at Providence, I think I was about the only member from the State of Michigan who was present there. I don't know that I can make any particular report. I received a letter from Dr. Prescott about a week or so ago asking me to make a report—a written report, but owing to the lack of time on my part, and also owing to the fact that the meeting has been already so fully reported in the trade journals, I thought nothing of that kind would be required from me. About all I have to say is that the attendance was very good; there were about one hundred and seventy-five members present out of a total membership of about thirteen hundred, which was more than the attendance at Pittsburgh the year before, or at Milwaukee the year before that.

The papers read at the meeting were fully up to the average, and I would say that the most important ones, in my opinion, that were read there were two papers by Dr. G. R. Eccles of Brooklyn, N. Y., one on "Peptonization," and the other on "Pepsins"; a very carefully prepared paper on the "Belladonna Leaves of the Market," by Dr. A. B. Lyons of Detroit; a paper on "Oil of Peppermint," by A. M. Todd of Michigan; a paper on "Abstracts," by Virgil Coblentz of Ohio, and one on "Spirit of Nitrous Ether," by E. Painter. I will simply say, you can find those papers in the trade journals, and I would advise you to read them.

The scope of the Association was very much broadened at its last meeting. The National Retail Druggist's Association and the American Pharmaceutical Association are now practically one, and probably will be made one in fact at the next meeting of the Association in Cincinnati. Heretofore, for a number of years past, the American Pharmaceutical Association, at least a part of the older members, has looked upon the Association as being simply a scientific body, and they did not propose to give any attention whatever to trade interests or anything of the kind. They did not think they had anything to do with the trade department of the pharmacists of the country, and of course we all know that with the great majority of the pharmacists of the country this bread and butter question has really become a paramount issue.

Next year at Cincinnati the Association will be divided into sections, each one taking up a particular line—one section taking up scientific matters, another legislative matters, another trade matters, and so on. These sections will each one attend to its own department separately, and will then submit their action to the general vote of the Association for approval.

The meeting was a very pleasant one, and the entertainments were generally very acceptable, especially, I believe, the trip to Newport, which, however, I was unable to attend—I had to leave before that time.

I don't know that I have anything more to say. Gentlemen, I thank you for your attention.

THE PRESIDENT—The next order of business will be the election of officers.

On motion, the President appointed as tellers Wm. Dupont of Detroit, and Geo. McDonald of Kalamazoo.

THE PRESIDENT—You will prepare your ballots for an informal ballot for President. I will call your attention to article 4 of the By-Laws which says: "Any one in arrears at an annual meeting shall not be entitled to vote." If there are any here who are behind in their dues they will attend to the matter in order to entitle them to vote.

An informal ballot was then taken and pending the counting thereof the President said: "While the tellers are counting the ballots I will announce the names of John E. Peck of Grand Rapids, and James Vernor, Detroit, a Special Committee on Transportation.

The tellers announced the result of the informal ballot as follows: Number of votes cast, 75; of which Dr. Crouter received 1; Dr. Lyons, 1; Mr. Eberbach, 3; Mr. McDonald, 9; Mr. Jesson, 8; Mr. Brown, 6; Mr. Wurzburg, 47.

Mr. Wells—I move that the vote just taken be regarded as a formal vote, and that Mr. Wurzburg of Grand Rapids be declared our President elect for the ensuing year.

Carried.

Mr. Wurzburg—Gentlemen, I thank you for the honor you have conferred upon me, and I will take great pleasure in meet-

ing all of you again, and as many more as possible, at Petoskey next July.

THE PRESIDENT—The next order will be the election of three Vice-Presidents. I think it has been customary to elect three Vice-Presidents on one ballot by specifying the vote as first, second, and third Vice-Presidents.

A MEMBER—I move to shorten the work in this way, that the member receiving the highest number of votes shall be First Vice-President, and the one the second highest number shall be Second Vice-President, and the one the third highest number the Third Vice-President.

Carried.

THE PRESIDENT—Three ballots will be cast by each person; one for each candidate.

Dr. CROUTER—I nominate Henry Harwood of Ishpeming, in the Northern Peninsula. as First Vice-President.

Mr. Wells—I nominate the lady who "sizes them up" for Vice-President.

A Member—That motion is not in order, for that lady is not a member of the Association. If she was I would be glad to support her nomination.

A ballot was taken, resulting in the election of Mrs. C. W. Taylor of Loomis, as First Vice-President; Henry Harwood of Ishpeming, Second Vice-President, and Frank Inglis, Detroit, Third Vice-President.

E. J. ROGERS, Port Huron—I move that this Association tender a vote of thanks to Mr. Stevens, of the University, for the splendid display of photographed plants.

Carried.

THE PRESIDENT—I will announce the standing committees, for the coming year:

Trade Interests—A. Bassett, Detroit; H. B. Fairchild, Grand Rapids; G. W. Crouter, Charlevoix.

Pharmacy and Queries—A. B. Prescott, Ann Arbor; A. B. Lyons, Detroit, O. Eberbach, Ann Arbor.

Legislation—Frank Wells, Lansing; J. E. Peck, Grand Rapids; Jacob Jesson, Muskegon.

We will now listen to the report of the tellers on the vote for Secretary.

The tellers announced the result of the vote for Secretary as follows:

Total number of votes cast 86, of which Mr. Allen received 29, Mr. Parkill 57. Upon which announcement being made, Mr. Parkill was declared by the Association unanimously elected.

THE PRESIDENT—The next order is the election of a local Secretary.

Mr. Bassett—I take pleasure in presenting the name of Mr. Harwood, of Petoskey. He resides in that place, and I am sure he is eminently fitted to look after the interests of the Association, and I move that the Secretary cast the ballot of the Association for the election of Mr. Harwood of Petoskey, as local Secretary for the coming year. Carried.

The Secretary cast the ballot, and Mr. Harwood was declared elected.

THE PRESIDENT—The next order is the election of Treasurer.

Mr. Stevens—I move that the Secretary cast the ballot of the Association for Wm. Dupont for Treasurer of this Association. Carried.

The Secretary cast the vote, and Mr. Dupont was declared elected.

THE PRESIDENT—The next order is the election of an Executive Committee of five members.

Mr. Jesson—Allow me a few words. A year ago the Executive Committee presented a report asking that this committee be selected, a majority of them from near the place of meeting. On this year's committee we have a majority living near Grand Rapids, and their work was done without expense to the Association. If that committee is selected from distant points of the State, it will be expensive to make arrangements for meetings of the Committee, and I think it would be better if a majority of the committee be selected from the northern part of the State.

THE PRESIDENT—You will proceed to prepare your ballots for five members of the Executive Committee.

A Member—I move that the thanks of this Association be tendered the press of the City of Grand Rapids for their kindness in reporting the proceedings of this Association. Carried.

Mr. Wells-Mr. President, I wish to offer the following resolution:

Resolved, That the kindly welcome extended to the Michigan State Pharmaceutical Association by the pharmacists of Grand Rapids, is most highly appreciated by us all. They are entitled to, and we hereby extend to them our most hearty thanks for their kindly and liberal efforts in our behalf. We are especially grateful to the Hazeltine & Perkins Drug Co., and to Mr. Church for the entertainments offered to and accepted by us. We shall carry away with us most pleasant memories of the hospitality we have all enjoyed at this meeting in the beautiful City of Grand Rapids.

THE PRESIDENT—I take pleasure in adding to that my thanks for the kindness and attention that has been shown me personally, as President, by the members of the Hazeltine & Perkins Drug Co.

The resolution was then adopted unanimously.

Mr. E. J. Rogers—I move that the Secretary be allowed two hundred dollars for his next year's services. Carried.

Dr. Prescott—There was a recommendation in the President's Address respecting an Assistant Secretary. I was not present at the time the report of the Committee upon the President's Address was presented to the Association, and I didn't learn that anything definite was done in that regard. Am I right?

THE PRESIDENT—The Committee reported that the Executive Committee and the Secretary together had power to employ an Assistant Secretary if they saw fit so to do. It was not thought advisable to elect one and the Association moved, I think, that no action should be taken in regard to the matter.

Mr. Prescorr—I beg leave to offer the following resolution: Resolved, That Dr. A. B. Lyons be appointed a Committee of Publication, to act, in association with the Secretary, in charge of the preparation of the proceedings for publication.

Carried.

Mr. Jrsson—I wish to move an amendment to the Constitution. Article IV. as it now stands, provides that the officers of this Association be elected at its regular annual meeting, without further specifying the time. The election of officers ought not to be crowded into the last hour of our last session. It should be made the regular order of business at some earlier period. I move that the words "the third sitting of" be inserted in the article referred to immediately preceding "the regular annual meeting." The clause will then read: "All of whom shall be elected at the third sitting of the regular annual meeting of the Association."

THE PRESIDENT -You have heard the motion, which will have to lie over another year until the next meeting of our Association for its adoption or non-adoption.

Mr. Wurzburg—I move that an order be drawn in favor of the janitor of this hall for the sum of five dollars for his services in care of this hall.

Carried.

THE PRESIDENT—Last year we had a special committee to visit the School of Pharmacy. I would ask whether it is the desire of the Association to appoint a similar committee this year?

Mr. E. J. ROGERS—I move the Chair appoint a committee of three to the School of Pharmacy from this Association.

Carried.

THE PRESIDENT—I announce as the committee to visit the School of Pharmacy, A. S. Parker, Detroit; E. J. Rogers, Port Huron, and F. M. Alsdorf, Lansing.

The election of five members of the Executive Committee were announced as follows: G. W. Crouter, Charlevoix; J. G. Johnson, Traverse City; Frank Wells, Lansing; George Gundrum, Ionia; Jacob Jesson, Muskegon.

THE PRESIDENT—That completes, I think, the business we have before us. The election of delegates is not necessary, as we shall have a meeting before the meeting of the National Associations.

Before the meeting closes, I wish to take occasion to thank all of you for the great kindness and consideration shown to me as your presiding officer. I take pleasure in introducing to you Mr. Wurzburg as my successor.

Mr. Wurzburg—I again thank you for the honor you have conferred upon me. I hope you will not expect a speech if you do, you will be disappointed as the hour is now late and many of you wish to leave the city. I once more thank you for the honor you have conferred upon me.

Mr. Wells—I wish to make this statement of our membership. It is now seven hundred and eighty-nine, and I wish we we could make it eight hundred.

Dr. CROUTER—I move that a vote of thanks be tendered to our President for the able manner with which he has presided over this meeting.

Carried.

The Association then adjourned sine die.

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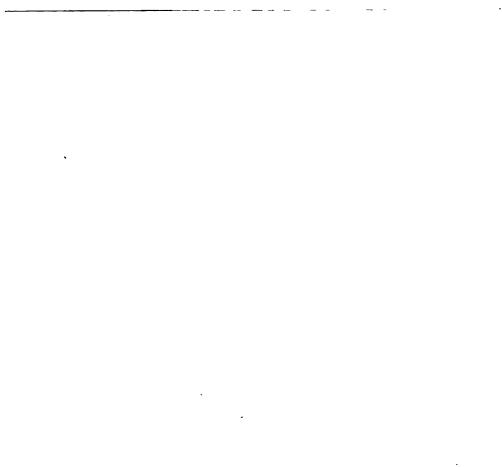
APPLICATION FOR MEMBERSHIP

N THE

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION.

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We hand you herewith the proceedings of the M. S. P. A., for 1886. It will repay a careful reading.

The next meeting of the Association will be held at Petoskey July 12, 13 and 14, 1887. We hope every member will plan to attend. Cheap rates on all railroads, and reduced rates at hotels will be given Druggists and their families.

Take a rest from your work during the heated July days, and meet with us for a season of rest and enjoyment, at the famous Summer Resorts of Northern Michigan. Take an excursion down the beautiful Traverse Bay, and catch a trout on the Jordan.

The interest in the meetings of the Association has grown every year, and we can promise that the coming meeting will be as rich in pleasure and information as any former one.

Owosso, Feb. 15, 1887.

STANLEY E. PARKILL, Secretary.

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ANSWERS TO QUERIES

-AND-

VOLUNTEER PAPERS,

READ AT THE FOURTH ANNUAL MEETING IN GRAND RAPIDS.

Query No. 28.

What Course of Reading and Plan of Study are advisory for the Assistant in Pharmacy?

A. B. PRESCOTT, M. D.

PREFATORY.

To study pharmacy is to study the materials supplied by the pharmacist in the proper exercise of his calling. To have due knowledge of pharmaceutical substances, and due skill in their treatment, is to be qualified to practice pharmacy. This knowledge includes an acquaintance with articles in their appearance, history, composition, character and deportment, their medicinal and poisonous effects, and their incompatibilities. This skill embraces a command over the substances, in combining them and determining their purity and strength, as well as in carrying them with mercantile prudence and acceptance.

As the materials on the shelves are the objects of pharmaceutical study, the drug store has certain obvious advantages as a place in which to prosecute a course of pharmaceutical reading. The reader has within reach of his eyes and hands the very articles with which acquaintance is to be made. Indeed it may appear at first as though a young man without the help of books or teachers, might make himself acquainted with the articles before him in the drug store. Fortunately no learner is so solitary as to be left altogether without books or teachers. The most benighted apprentice to be found in pharmacy at present learns from others a thousand things not known to the best

apothecary in Europe a hundred years ago. The very names on the bottles represent a century of research. To set out to learn pharmacy absolutely without help, is to undertake to do alone the work that the entire pharmaceutical world has done in all the time since pharmacy began. A solitary learner placed in the drug store, stands there as one in the very beginning of art and science. A hundred and twenty-five years ago, young Scheele, a Swedish apothecary, began to study, with all the help he could get in that early time, but the young men who neglect the good helps offered at present, are not the ones to accomplish discoveries, such as Scheele gave to those after him. Since then a great pharmaceutical literature has been accumulated, long labor has been devoted to simplify science, and if we neglect the use of books and teachers in our profession, we refuse to benefit by all the rich heritage of pharmaceutical experience. pharmacists of the world, working together and helping each other through books and journals and societies and schools, always with the aid of general science, have been more than a hundred years in obtaining their present acquaintance with these drugs before us on the shelves. How shall the single learner make his acquaintance with these substances, if there be nothing to help him?

For one instance, here is the quinine marked quinine sulphate. The unaided learner, by long attention devoted to this article and its behavior, may come to know how it looks and whether it has smell or not, what liquids will dissolve it and what other liquids will mix with the solution so made, how much of it might be put in a dose without a blunder, and at what current price it can be furnished. As much as this, by the hardest, he may come to know, while yet the article stands in his mind as a body without history or relations, a thing without constituents or classification. It is known and it is not known; known as a mass of white, silky crystals; not known as one of the alkaloids, or as one of the sulphates, or as consisting of chemical elements united in regular proportions, or as one among a number of related products of an important botanical species, or as a chemical body responding to treatment in a characteristic way. The pharmaceutical world has come to know the character of quinine by virtue of accumulated experience in the chemistry, botany and operative pharmacy of materials in general.

To obtain a satisfactory knowledge of one drug, it is first necessary to gain some facts that are common to all drugs. When the learner consults a Dispensatory for information about epsom salt, he is met by certain chemical formulæ; when he turns for a description of rhubarb, he comes upon botanical terms; when he seeks directions for making a tincture, he finds the solvent to be defined by its specific gravity. The full and proper meaning of chemical formulæ is to be learned from chemistry for all chemical compounds together; the botanical terms are explained in botany for all vegetable drugs; the methods of taking specific gravity and thereby estimating the strength are presented in operative pharmacy for all liquids Primary chemistry, and operative pharmacy, and botany, obtained in the beginning, will throw light over the pharmacist's acquaintance with the individual articles of his business for a life-time.

If the assistant or apprentice in pharmacy would enter upon a course of study, he must first arrange for some time to devote to a book. With whom is he to make this arrangement? Firstly and mainly, he is to arrange it with himself. How much time can he gain each day for reading? Can he have such remnants of time as will amount to one hour daily for this purpose? If not an hour, can he secure half an hour a day? As his interest increases, the study-hours will receive additions. In the allotted time let him read with eagerness, read for things to turn over in the mind and memorize while cleaning up the store and washing bottles. What he gets let him hold with a good grip, and avoid the omission of a day's reading as he would avoid the loss of a dollar from his pocket.

For the duties of pharmaceutical practice, the proprietor is the preceptor, and he is a teacher at hand. It is to be the better qualified for these duties that a systematic course of study is to be undertaken by the assistant. What is here given is designed to co-operate with the direction of the master of the pharmacy. Indeed it is not designed to offer here a plan of study which shall at all supersede the advisory direction of proprietors, or which shall take the place of schools, or published reading courses. The purpose of the writer is simply this, to present a plan of study for adoption where no plan of study now exists.

ORDER OF STUDIES.

1. Study the principles of (1) chemistry, (2) operative pharmacy, and (3) botany,—reading concise primary text-books of these branches, till they are thoroughly understood. Take the chemistry by itself until it is fairly learned.

II. With the light of the first principles, study the more important of the materials and operations of the shop, taking one at a time, and reading upon the article or the process in hand, by reference to the pharmacopæia, a dispensatory, the primary text-books already studied, and other accessible works. Give habitual attention to the doses of medicine.

CHEMISTRY.

This comes first in the order of reading. Primary chemistry can be found in any reasonably good small text-book, and of these there are scores. For the purpose here specified the writer recommends either Attfield's Chemistry as a book both for reading and reference, or Shepard's Chemistry as a much briefer book mainly for reading. Attfield's Chemistry* has been built up by its author during his long term of service in charge of the laboratories of the School of Pharmacy of the Pharmaceutical Society of Great Britain. The wide scope of the work is indicated by its title, Chemistry—General, Medical and Pharmaceutical. It has, for pharmacists, the advantage of illustrating general chemistry from the pharmaceutical standpoint, and for first reading it has the disadvantage of putting too much subject matter into the reader's hands at once. The first half of the book unfolds general chemistry, and qualitative analysis, with constant applications to the United States Pharmathe last half of the book presents brief compend of quantitative, medical and pharmaceutical analysis — the whole forming a concise work of reference. The index has 8,000 references. the first principles of chemistry in Attfield the reader must

^{*}Tenth edition. Specially revised for America, and adapted to the United States Pharmacoposis of 1880. Philadelphia, 1883: Lea.

devote his attention to the first 128 pages, as though this part were bound separately. The directions on pages 58 and 128 are to be obeyed; and the learner should return to the first 58 pages and read it again, from time to time, at different stages in study, until the important truths of chemistry are clearly understood. In the course of the first half of the book the methods of qualitative analysis are gradually introduced; the solubilities of salts are classified; chemical equations are explained, and, what is of the utmost importance, directions are carefully given for calculating quantities of materials from the chemical proportions stated by an equation. To be able to so calculate quantities of materials gives great advantage in pharmaceutical work, and places a basis for quantitative analysis. better if this part of the subject had fuller treatment in the book; but nothing serves for its mastery except patient and continued application on the part of the student. questions in the book are helpful. Shepard's Chemistry * has been prepared by a Michigan teacher, for High School classes having laboratory work, and it brings the qualitative examination of substances, in an outline of qualitative analysis, into early exercise in lucid explanation of the foundation principles of chemical science. The private reader will take note of the introductory directions to the teacher. The study of chemical equations is well presented, but only very brief exercises are given in the calculation of quantities from chemical proportions. With this book the reader will be left to make his own applications to the pharmacopœia and to special pharmaceutical operations. For the first principles of the science, however, and its direct use in simple qualitative tests, the little work of Prof. Shepard is all that can be desired.

Both of the chemical text-books just mentioned give the learner directions for simple experimental operations, and both of them introduce an outline of qualitative chemical analysis. Attfield gives special attention to little experimental preparations called synthetic exercises. The exercises in analysis are valuable in three ways—they illustrate chemical action, they give acquaintance with substances, and they qualify the learner to

^{*}Elements of Inorganic Chemistry, Descriptive and Qualitative, pp. 877. 1885: D. C. Heath & Co., Boston.

determine the purity of drugs. Now, if the learner has no opportunity to make experiments and tests, this is no reason for giving up the study. With a real thirst for knowledge, and with a steady determination to succeed, enough of general chemistry can be gained by persistent reading without experiment to yield satisfaction and advantage all through life. Moreover, if the learner will patiently preserve his enthusiasm, he will find the operations of the shop coming before him from time to time as illustrations of his studies, and full of meaning when understood.

The opportunity of the assistant or apprentice to make experimental tests is properly subject to the control of the proprietor, and to the terms and spirit of the engagement with him. In some of the countries of Europe the law provides for the apprentice a measure of material for exercise in analysis; but in this country neither law nor custom makes this provision, and the privilege certainly cannot be assumed. It belongs to the proprietor, by virtue of his position, to encourage and favor the professional improvement of his employes by all suitable meas-And, in respect to apprentices, employes not registered for pharmaceutical practice under State law, the logic of the situation implies that the subordinate should have opportunities which may enable him to pass the State examinations standing before him. Certainly pharmacists are desirous of the professional improvement of their employes. This subject is one worthy of a wise elucidation from the practicing pharmacist. At all events, if tests and experiments be made with any wastefulness or disorder, the learner should expect in consequence to forfeit all favors of this nature. The same is true if expensive materials be used in wasteful quantities; if utensils and wares be left injured or uncleaned; or if proper duties be neglected. And the learner should know that the best conditions of experimentation are those of neatness, minuteness, and simplicity. As a rule it is better to make a test with a drop than with a drachm. A single drop of a liquid chemical, on a glass slide or a slip of window glass (treated with a drop of another liquid used as a reagent) while the glass is held over a ground either black or white as contrast of color requires, will serve admirably

in numerous tests of identification. Should it be desired to cultivate chemical analysis beyond the limits here provided for, at a later period a book or two specially devoted to analytical chemistry can be obtained.

THE STUDY OF INORGANIC CHEMICALS.

When the first principles of chemistry have been gained, the learner should study the chief Inorganic Chemicals described in the chemical text-book (Attfield's, Shepard's or other), as they are seen and accessible in the stock of the store,—taking them in the order in which they are given in the chemistry, or in other order if more convenient. In taking up these articles, as in all study of the drugs of the store, refer to their descriptions in the United States Pharmacopœia. Observe that, for chemicals, the U.S. P. gives, in a fixed consecutive order, the legal name in Latin and in English (the latter being pharmacopeial as truly as the former), chemical formulæ and molecular weights, definition, description, tests of identity, tests of purity, tests of strength, and a list of preparations wherein In this order the "description" presents color and structural form, taste, odor, reaction to indicators, solubilities in water, alcohol, ether, etc. at 15° C. (59° F.) and at boiling point, and the effects of heat in melting point, boiling point, loss of water of crystallization, or in decomposition. of purity are given with an explanation of their purpose, placed in parentheses. If the pharmacopæia be not accessible, the pharmacopœial descriptions quoted in the dispensatories may be resorted to, but the learner should prefer to use the national code of pharmacy in its own text, without mutilation or addi-Reference reading in the dispensatories and other works comes now in order in study of the chemicals of the stock, and throughout this reading the primary chemical text-book should be consulted as often as required for a full understanding of all chemical statements. Note should be made of the quantity in which each medicinal chemical is administered, and a dose-list should be a habitual companion.

BOTANY.

It is not necessary to delay the study of botany to follow reading in operative pharmacy, but these two subjects may now

be carried along together. Gray's Lessons in Botany are to be taken in hand with the assurance that they are full of the needed practical information, set forth in the simplest and clearest language, by the great American botanist himself. After four lessons on How Plants Grow, there are seventeen lessons on the regular forms and changes of the Parts and Organs of Plants,—and these lessons, with four following on the Structure of Plant Tissues, contain such information as one must have in order to understand the descriptive terms by which vegetable drugs are defined. During the reading of the lessons just named, illustrations should be sought for and noted among growing plants and among the dried plants furnished in pharmacy, as well as in the various printed illustrations at command. And after one careful reading of the text of the lesson, the work should be continued for some time upon botanical descrip-Finding a description of a plant under observation, or of a dried drug in hand, the printed description is interpreted by help of the Glossary and verified by inspection of The Glossary or dictionary of terms in Gray's Botany is thickly sprinkled with references to the text, so that the subject matter immediately required to interpret a description is placed at the learner's easy command. Persevering in this mode of study, an acquaintance will be made with plant forms, and the language by which these are designated. At length the reader will be able very clearly to picture to himself the appearance of a plant, or a drug, solely from the botanical description. For this practice, botanical descriptions of plants and vegetable drugs can be reached in the dispensatories, and in the Pharmacopæia. If full descriptions of plants in general be desired, Gray's Manual of Botany will be obtained. The manual of Organic Materia Medica by Professor Maisch presents the same botanical descriptions given in the Pharmacopœia with additional ones.—To summarize, the direction for botanical study stands as follows: (1) Acquaintance with the organs of plants and the terms for their description. of primary importance, and is not difficult for the unaided (2) Some knowledge of the structure of plant tissues

as seen in section under a magnifier. To carry this far would require a microscope, by which to identify drugs in powder.

(3) An understanding of the functions of growing plants. (4) Familiarity with the classification of plants.

ORGANIC CHEMISTRY.

Near to the botanical study of vegetable drugs, as organized structures, should be some chemical study of plant constituents, as organic compounds. If Attfield's Chemistry have been obtained for primary chemical study, the same work will serve for the organic chemistry of this course of reading. Descriptive organic chemistry is given within pages 376 to 488 of Attfield, but in a way more useful for reference than for consecutive reading. An excellent primary reading book in organic chemistry is that of Remsen.* Without a living teacher, and laboratory illustrations, the subject is not an easy one, and the unaided reader can hardly be expected to obtain a connected understanding of the chemical structure of the organic groups. Nevertheless, if the first principles of general chemistry have been learned, a great deal of organic chemistry can be obtained by the continued use of such an introductory work as that of Remsen. After reading such portions of the book as the learner can understand, let him return to it, habitually, for explanation of the chemical formulæ of articles of organic composition, as these shall be taken up for individual study.

OPERATIVE PHARMACY

may with advantage be entered upon next after general chemistry, and carried along with the botany. The pharmacopæia presents only directions for preparations; the dispensatories give selected processes; and Reminoron's Pharmacy† contains a connected treatise upon methods of pharmaceutical operation. The learner is advised to begin by a single reading of Part I, to page 245, on the Operations of Pharmacy, and then, without waiting for full study of all the subject matter, take up practical questions in weights, measures and specific gravities.

^{*}An Introduction to the Study of Compounds of Carbon, or Organic Chemistry. By Ira Remsen. 1885. Boston. pp. 856.

[†]A Treatise on the modes of Making and Dispensing Officinal, Unofficinal, and Extemporaneous Preparations, with Descriptions of their Properties, Uses, and Doses. pp. 1080. 1885. Philadelphia: J. B. Lippincott Company.

It is a good exercise to take British directions for preparing a tincture, with avoirdupois weight and imperial fluid measure, and convert the quantities of materials into United States denominations of troy weight and wine measure. student can propose questions to himself, like the following: How many fluidounces, wine measure, in one pound (avoirdupois) of sulphuric acid (of U. S. P. specific gravity)? How many in one pound of stronger ether (U. S. P.)? Of alcohol? Of water? Of other selected liquids, of stated specific gravities? How many troyounces in one pint of each of the liquids just named? How many grains of absolute hydrochloric acid in one troyounce of U.S. Pharmacopæial hydrochloric acid? fluidounce of the same? So far each question concerns only one given substance, a certain quantity of which, taken by weight or volume, is compared as to its proportion, to some other quantity taken by weight or volume, or as to the quantity it holds in a given mixture. Questions of another sort involve chemical proportion between one substance and another substance, questions with which the learner should have had some practice while reading chemistry, as before specified. Both of the text-books named under Chemistry introduce the calculation of quantities upon chemical proportion, according to an equa-Examples like the following may be entered upon: To precipitate a solution of 1 av. lb. of sulphate of iron, crystallized, how many grains, or av. oz. of crystallized carbonate of sodium will be required (each salt being first dissolved in a sufficient quantity of water)? To neutralize one troyounce of sulphuric acid, how many troyounces of water of ammonia will be required? Substituting fluidounces for each article in this question, what will be the answer?*

^{*}The following rules may serve to lead the way in solving these problems:

^{1.} In chemical proportion between two substances, having a given weight of one (a), to find the weight of the other (x), when both substances are represented in a true chemical equation:

Combining number of a: combining number of x:: parts by weight of a: x-parts by weight. The given weight of a, and the ascertained weight of x, are true only of the absolutely pure substances represented by their chemical formulæ, with or without water of crystallization.

^{2.} In percentage proportions of any substances:

^{100:} number per cent.:: parts by weight of "dilute": x-parts of "absolute."

Number per cent.:: 100:: parts by weight of "absolute": x-parts of "dilute."

8. In converting weights to volumes, and volumes to weights: with denominations equal for water:

equal for water:
Volume of any substance × specific gravity—weight.
Weight of any substance + specific gravity—volume.
It is well to think that a fluidounce does not weigh anything, and that the weight of matter filling a fluidounce depends on what the matter is,

In operative pharmacy now read by reference, taking first such preparations as are made in the store, and reading upon each in succession, all that is given in Remington's Pharmacy, and in the Dispensatories accessible. Study percolation as described in the "Preliminary Notices" of the United States Pharmacopoeia, in Remington, and in other works. Take up the classes of galenicals, the tinetures, extracts, fluid extracts, syrups, liquors, and waters,—in the same way, reading upon each of these classes, by reference. Read the historical introduction, the proceedings of the national convention, and all the prefatory matter of the United States Pharmacopoeia.

At this time give systematic study to the doses, and poisonous effects of medicines, having a dose list in your pocket to study at odd moments, or compiling a dose list, made up from the Dispensatories and written out alphabetically.

EXTEMPORANEOUS PHARMACY.

In this branch it is advised to read Part V. of Remington's Pharmacy, studying the directions for reading prescriptions, and applying them to practice upon such files of these as are accessible. If at any time the student desires to give additional attention to the Latinity of prescriptions, he will find the little primer of Professor Gerrish, entitled "Prescription Writing," the very help he needs. In the methods of work at the prescription stand, and the various special difficulties of this art, helpful reading will be found in the work of Remington, and in the files of pharmaceutical journals.

GENERAL PHARMACOGNOSY.*

A study of the more important drugs in the store, by reference reading, with the articles in view, is one of the most interesting and favorable methods of pharmaceutical improvement. For chemicals, or inorganic articles, this mode of study has already been urged, and its fuller adoption for all sorts of drugs

^{*}In this plan of study portions of Pharmacognosy have been introduced in "The Study of Inorganic Chemicals" following Chemistry, and in the examination of crude vegetable drugs in prosecution of "Botany," Pharmacognosy in general is often designated as the *Materia Medica* of pharmaceutical learning. As such it includes chemical, botanical, and historical acquaintance, also a knowledge of poisonous effects in the physiological action of medicines, as indexed in part by the statements of "doses," but does not include therapeutics. The materia medica of medical learning is usually given along with therapeutics, in the same books and lectures.

and preparations, and for the operations of pharmacy, has been delayed until this stage of study only because it was needful to give all the time at command to preparatory reading. After the rudiments of chemistry and botany, organic chemistry and pharmacognosy, and of operative and extemporaneous pharmacy have been learned,—any drugs can be studied by means of reference reading, with the utmost profit. Read different books on the same subject. Consult the Dispensatories and the various compilations kept in the store. Find the subject by the index, anywhere. Refer back to the elementary text-books to supply what is not understood. Last and best of all, consult the files or bound volumes of the journals on the subject matter in hand.

THE JOURNALS.

The periodical literature of pharmacy is a valuable means of professional improvement for all pharmacists. Its usefulness is the greater to those who have had a course of systematic reading, still greater if they have enjoyed a course of training in a school of pharmacy. But whether with or without this preparation no pharmacist need neglect the multiplied advantages of the pharmaceutical press at the present time. It is true that few who are engaged in pharmacy have leisure to read the journals through while they are fresh. Well, it is only the newspaper that is to be read so far as read at all while it is The pharmaceutical news—the current intelligence of the profession—is to be read in the last number; but the solid articles, the portion of permanent value, in most journals the larger portion, is to be seen rather than read at the time of its appearance. The solid articles are to be used at such times as they are wanted—rarely at such times as the mail happens to They will be wanted to answer questions arising bring them. in practice, and they may well be used, each in its place, in a course of systematic reading such as has been here outlined. For real service, then, the journals are to be kept on file in order; and the completed volume, with its index, is to be stitched or bound, at all events kept intact, as an addition to the works of reference in the library. Without an index the volume is scarce worth saving. The information in a published article is worth most at the time it is most wanted, when the

attention will be awake to its statements, when thought can be given to them, and when the memory will hold them. The young reader of the journals may be advised to take note of the names of authors, foreign and American, and to cultivate acquaintance with personal authorities. Also to bear in mind that upon various questions of professional judgment men differ from each other in opinion; the absolute truth is difficult to attain, and it is well to compare as many authorities as possible upon any given point.

This advice regarding general reading is applicable to all who are engaged in pharmacy, as well as to the class for whom this article has been prepared. Young men who have been blessed with the beneficent advantages of a college course in pharmacy, especially those who, with a good general education, have had the superior opportunities of training by laboratory methods of study in systematic courses under living teachers, are especially urged not to neglect constant acquaintance with the current literature of pharmacy. It gives life and spirit and courage during the long hours devoted to exacting duties, and under the burden of responsibilities not well appreciated, to have acquaintance with the active and capable pharmacists of this and other countries in their written communications to the profession.

SUMMARY.

The course of reading and plan of study presented in this article may be tabulated in brief, as follows:

- General Chemistry; First Principles; Attfield (first 128 pages) or Shepard.
- 2. Study of Inorganic Chemicals in the Store,—referring to the U.S.P.
 - 3. Operative Pharmacy; Remington's Part I.
 - 4. Botany; Gray's Lessons.
 - 5. Organic Chemistry; Attfield or Remsen.
- 6. Practice in the conversion of weights, volumes, and chemical proportions. Reference reading.
- 7. Study of the crude drugs of the store, their constituents and products. Doses. Reference reading.
 - 8. The poisonous effects of medicine. Doses.
- 9. Extemporaneous Pharmacy; Prescription Difficulties; Language of Prescriptions, and practice in their interpretation. (Remington's Part V; Gerrish on Latinity. Reference reading.)

10. General Pharmacognosy and Pharmacy. A study of the drugs, preparations, and operations of the store. Reading by reference to the books already named, the Dispensatories, etc. Reference reading of the Periodical Literature.

EXAMINATIONS.

Should it be asked, will the course of reading and plan of study here laid down, enable a young man to pass the examinations of the Board of Pharmacy of the State, as required by law, for those entering upon pharmaceutical practice,—the writer, in reply, would quote from one who has watched the workings of the State examinations in Great Britain for twenty years—a master in pharmaceutical education—Prof. Attfield, himself, in his advice to the reader, given in the text-book already several times referred to. He says:

"It is unnecessary to advise you to avoid studying merely by way of 'preparation for examination.' You will not so mistake the means for the end. You are studying to fit yourself for your position in the world. Work diligently; study thoughtfully, and deliberately, above all, be thorough, otherwise your knowledge will be transient, and will be unaccompanied by that enlightenment of the understanding, that mental training, mental discipline, and general elevation of the intellect which constitutes, in a word, education. When you are thus educated, you will with ease and pleasure pass any examination in the knowledge you have thus acquired."

Volunteer Paper.

A Study of the U.S. Pharmacopæial Method of Assaying Opium.

T. J. WRAMPELMEIER AND G. MEINERT.

The U. S. Pharmacopæia gives the following process for the assay of opium, viz: 7 Gm. of the drug are triturated with 3 Gm. of freshly slaked lime and 70 C.c. of water in a mortar. The mixture is then placed upon a filter, and 50 C.c. of filtrate taken to represent 5 Gm. of opium. To the 50 C.c. of filtrate are added 5 C.c. of alcohol, 25 C.c. of ether, and 3 Gm. of ammonium chloride, and the solution allowed to stand for twelve hours. The precipitated morphine is then filtered out, using counterpoised filter papers, dried at a temperature of 55°-60° C. and weighed. By multiplying the weight by 20, the per cent. is obtained.

This method of assaying opium was first suggested by two French chemists, Portes and Langlois (1881: Jour. de Pharm. et de Chem., New Rem., 1882, 64). These chemists assumed that 53 C.c. of the filtrate must be taken to represent 5 Gm. of opium, whereas the U. S. P. process directs that 50 C.c. of the filtrate be taken as equivalent to 5 Gm. of opium. Mr. Conroy, in a paper read before the British Pharmaceutical Conference (1884: Pharm. Jour. Trans. [3], 15, 473), claimed to have found by experiment, (though he does not describe his experiment) that 52 C.c. must be taken to represent 5 Gm. of the drug, saying that these 2 C.c. must be allowed for increase of bulk due to the extractive matter dissolved by the water, and that, by taking the 50 C.c. as the U. S. P. directs, a serious mistake was made.

In order to decide this point, namely, whether 50 C.c. or 52 C.c. of filtrate should be taken, it was necessary to ascertain whether the total liquid, that is, the 70 C.c. of water, plus the extractive matter dissolved thereby, was really more than 70 C.c.; for, if 52 C.c. have to be taken to represent 5 Gm. of the drug, the total liquid must be 72.8 C.c.

To this end the following experiments were made: 7 Gm. of powdered opium were taken, dried at 100° C. and transferred to a flask. A flask was used instead of mortar, in order to avoid loss by evaporation. 3 Gm. of freshly slaked lime and 70 C.c. of water were added, the whole thoroughly mixed and allowed to stand for half an hour. The mixture was then placed upon a filter and (instead of taking 50 C.c.) the liquid was drained off as much as possible by means of an aspirator. The filtrate was weighed, and its spec. gr. taken. In order to determine how much liquid there was left in the opium on the filter, the filter was weighed with the funnel, dried at 100° C. to constant weight, and again weighed. By multiplying the loss in weight by the spec. gr. of the filtrate, the weight of the liquid left in the opium was found. In the same manner, the weight of the liquid left in the macerating flask which could not be brought upon the filter was determined. The weight of total liquid was then found by adding to the weight of the filtrate the weight of liquid left in the opium on the filter, and that of the liquid left in the flask, and, from this the total volume, i. e., the 70 C.c. plus the extractive matter dissolved thereby, was calculated by dividing by the specific gravity.

On working two samples of powdered opium in this way, the volume was found to be in the one case 70.83 C.c., and in the other it was 70.85 C.c.; whereas, according to Conroy, the volume should be 72.8 C.c. Since the U.S. P. directs to take opium in any form, it seemed possible that, if lump opium which contains some moisture be used, the volume of liquid might be increased. A sample of lump opium was taken which contained 11 per cent. of moisture. 7 Gm. were weighed off, cut into small pieces and transferred to a flask. Then the lime with 70 C.c. of water were added, the whole thoroughly mixed by means of a stirring rod until a uniform mix-The mixture was then allowed to stand for ture was obtained. half an hour and finally placed upon a filter. The filtrate was weighed and its specific gravity taken, and the weight of the liquids left in the opium on the filter, and that of the liquid left in the flask, were calculated in the above-described manner.

Experiments made with	h two sample	es gave the followi	ng results:
Sp.	Gr. of Filtrate.	Per Cent. of Morphia.	Total Liquid
Experiment I	1.01270	8.3 per cent.	70.89 C.c.
Experiment II	1.01265	9.04 per cent.	70.19 C.c.
Average			70.29 C.c.

This gave an average increase of 0.29 C.c. Then a very moist lump opium containing 20.7 per cent. moisture was used and the volume of liquid was found to be, in this case, 70.61 C.c. These experiments, therefore, would seem to prove that the volume of filtrate directed to be taken by the Pharmacopoeia (50 C.c.) is more nearly correct than that directed by Mr. Conroy (52 C.c.).

In the paper of Mr. Conroy attention is called to the fact that some morphine is held in solution by the mother liquor. Mr. Herbert Lloyd, in an article (American Druggist, 14, 221), also states that there is enough morphine held in solution to cause an error of 1.2 per cent. to 1.8 per cent. He believed that the alkaloid is dissolved by the excess of ammonia which is set free when ammonium chloride is added. The reaction may be given by the following equation:

 $Ca(OH)_2 + 2NH_4Cl = CaCl_2 + 2NH^2 + 2H_2O.$

He also says that morpine and lime are mutual solvents, that is, if morphine is added to lime-water, more lime will be taken into solution, and, hence, he comes to the conclusion that the greater the amount of morphine present in the opium to be assayed the greater will be the amount of lime and ammonia set free, and as a result the greater the loss of morphine. Mr. Lloyd based this assertion upon the results of experiments made with weighed quantities of morphine, slaked lime, and ammonium chloride. He said that 50 C.c. of lime-water in the presence of morphine, would dissolve 0.128 Gm. of Ca(OH)₂ or 0.095 Gm. of CaO.

In order to determine the amount of lime held in solution in an actual assay, the following experiments were made: The mother liquor of the 50 C.c. filtrate was acidulated with sulphuric acid, evaporated to dryness, and heated in a platinum dish, and the lime estimated as CaSO' which was calculated to

CaO. In order to determine the relation between the proportion of morphine and amount of lime, a lump opium containing 7.88 per cent. of morphine, and for another experiment a powdered opium containing 11.4 per cent. of morphine, were used, and the following results obtained:

Amount of	Morphia Obtained.	Amount of Lime (CaO).
Lump opium	0.394 Gm.	0.202 Gm.
Powdered opium	0.570 Gm.	0.231 Gm.

So we see that the more morphine there is present, the greater is the amount of lime dissolved, and this experiment would seem to support Mr. Lloyd's statement with reference to the mutual solvent power of morphine and lime, although the increase in the amount of lime dissolved is not in the same ratio as the increase in the amount of morphine present. The amount of lime found to be present in the assay liquor, according to our experiments, is, however, about twice as large as the amount of lime contained in the 50 C.c. solution according to Mr. Lloyd, showing that other constituents of opium assisted in dissolving the lime, and it is not improbable that these constituents are present in varying proportions.

In order to determine now how much of the alkaloid is dissolved in the mother liquor after crystallizing the morphine, a solution was made to correspond as nearly as possible to the assay liquor, and then a certain amount of morphine was used. The amount of lime (CaO) found to be present in the mother liquor of the lump opium was 0.202 Gm. This amount of lime was taken, slaked with a little water, transferred to flask and 50 C.c. of distilled water were added. On adding then 0.500 Gm. of pure morphine, it was found that some of the lime was left undissolved. Therefore, in another trial, a little less calcium oxide was used, the 50 C.c. of water and 0.500 Gm. of morphine added. Then, as in the U.S.P. process, 5 C.c. of alcohol and 25 C.c. of ether, and 3 Gm. of ammonium chloride were added and the mixture allowed to stand for 12 hours. The amount of morphine obtained was 0.442 Gm., showing that of the 0.500 Gm. taken 0.058 Gm. was retained in solution in the mother liquor.

In order to find out whether the morphine is held in solution by the excess of ammonia liberated or by the excess of ammonium chloride, the following experiments were made. By calculation it was found that, when 0,202 Gm. of calcium oxide are in solution, 0.399 Gm. of ammonium chloride are Subtracting this from 3 Gm., we find that in decomposed. this case there is an excess of 2.61 Gm. of ammonium chloride present in the assay liquor. This amount of ammonium chloride was then dissolved in 50 C.c. of pure water and 0.500 Gm. of morphine added, and the solution allowed to stand for 12 hours, after which time 0.500 Gm. of morphine had lost 0.135 The amount of ammonia which would be set free in such assay was also calculated, and a solution of 50 C.c. of pure water containing that amount of ammonia was found to dissolve after 12 hours' standing 0.110 Gm. of morphine. Thus it was shown that both ammonium chloride and free ammonia in solution exert a distinct solvent action upon the alkaloid. therefore probable that by using about 1.000 Gm. of ammonium chloride instead of 3.000 Gm. as suggested by Mr. Conroy, the amount of morphine held in solution will be greatly reduced.

There are one or two points in the detailed directions of the Pharmacopæia which, it seems to us, are open to criticism. The directions are to triturate the opium, lime, and water together, and leave the mixture in a mortar for half an hour. The evaporation of moisture from an open mortar, especially if the atmosphere happens to be dry, is not inconsiderable, and it is quite probable that the failure to obtain the desired amount of filtrate can be explained, in some cases, in this way.

The U. S. P. directs that the filtrate be collected in a widemouthed bottle or flask (having a capacity of about 120 C.c. and marked at 50 C.c.). If a flask be used, the 50 C.c. mark will be at the widest part and it would be an easy matter to make an error of 1 to 2 C.c. in graduating or in filling to the mark, as we found by repeated trials. In all of our experiments we used a narrow graduated cylinder to measure the filtrate.

Want of time has prevented us from continuing our experiments, but we offer the following conclusions as the result of our experiments.

- 1. The increase in volume by solution of extractive matter is not sufficient to warrant us in taking 52 C.c. of the filtrate as representing 5 Gm. of opium. The volume directed by the U. S. P. (50 C.c.) seems to be very nearly correct. At least it would require a large number of experiments to warrant us in changing that.
- 2. About 10 per cent. of the morphine in the opium is retained in the mother liquor after crystallizing the morphine according to the U. S. P.
- 3. Excess of either ammonium chloride or free ammonia increases the solubility of morphine in the mother liquor, and experiments should be made with a view to reducing the amounts of ammonium chloride and of lime.
- 4. The mixture of opium, lime and water should not be allowed to stand in an open mortar, but might be made in a mortar if necessary and transferred to a stoppered flask or covered vessel of some kind to macerate.
- 5. The filtrate should not be measured in a bottle or flask, as directed by the U. S. P., but in a narrow graduated cylinder.

Query No. 54.

What is the Proportion of Oxidized Mercury in Mercury with Chalk?

Prof. O. C. JOHNSON.

The mercuric oxide was estimated by dissolving in hydro chloric acid, precipitating by hydrosulphuric acid, and weighing as mercuric sulphide.

The mercurous oxide was found by dissolving in hot acetic acid (one part of glacial acetic to three volumes of water), precipitating by hydrochloric acid, and weighing as mercurous chloride.

Number two, which contains over ten per cent of oxidized mercury, had been kept in the store over three years. In other cases, where the time was known, it varied from one to six months.

No. of Sample.	Per cent of Mercuric Oxide.	Per cent. of Mercurous Oxide.	Total per cent. of Oxidized Mercury.
1	25	none	. 25
2	7.41	3.20	10.61
8	1.28	1.89	8.17
4	14	none	.14
5	07	1.28	1.30
6	08	none	.08
7	66	none	. 66
8	00	none	none
9	04	none	.04

Query No. 31.

Alkaloid Valuations of Fluid Extracts of Veratrum Viride are Desired.

H. W. Snow, PH. C.

To all who have given the chemistry of the Veratrums a study, even of a superficial nature, it will be evident that in replying to this query it will be possible to do little more than give comparative results, and that nothing positive can be attempted in the present state of our knowledge of the drug and its chemical constitution. This might, perhaps, be urged with force against many other drugs of the materia medica, though possibly with greater force against some, say cannabis indica, or digitalis, as an illustration, and on the other hand with less force against others, for example, nux vomica or the Veratrum viride contains, according to the recent investigation of Wright & Luff,* at least six different alkaloids, two, however, of which are present in traces only, while the remaining four are present in appreciable quantities. Wright & Luff have settled the qualitative nature of the root it is evidently doubtful whether the quantities and relative proportions stated by them will be found to hold good as time goes The alkaloids and quantities, according to their investiga tions, are as follows:

Cevadine	C** H49	N	O ₉	0.043 per cent.
Jervine	C:7 H47	N	0 1	0.020 per cent.
Pseudojervine	C** H45	N	O7	0.015 per cent
Rubijervine	C*6 H46	N	O ₃	0.002 per cent.
Veratrabine	C** H4*	N	O ²	traces.
Veratrine	C87 H58	N	0	traces.
Total				.0.080 per cent.

Of this small percentage of alkaloids it will be seen that they consider one-half to be cevadine, and about one-fourth

^{*}Journal Chemical Society, xxxv.-pp. 405-421.

jervine, with small quantities or traces only of the remainder. Bullock,* on the contrary, has found as high as 0.66 per cent. of alkaloids, two-thirds of which was nitrate of jervine, and it will be seen that the writer has obtained as high as 0.42 per cent. of the jervine (determined from its nitrate) in fluid extract of the Bullock has shown that in concentrating alcoholic extracts of this drug, the resinous matter, which separates out, carries with it a very large portion of the alkaloids, and it is to this cause that the low rates of Messrs. Wright & Luff may be attributed, they having overlooked this fact. So far as the writer is aware the relative physiological effects of these alkaloids have never been determined,† and this fact, together with the complexity of the drug, makes it impracticable to state with certainty very much regarding the strength of its galenical preparations. But the writer, for purposes of his own, has resorted to the use of Mayer's reagent, which, probably, yields results which are much better than no results at all, even though it is necessary to state them as the number of cc. of the reagent which are required to precipitate the alkaloids contained in a known volume of the fluid extract. As jervine is evidently the most abundant alkaloid contained in the drug, a brief description of its more important properties may be of analytical inter-The salts which are of most interest are the acetate, which is freely soluble in water, and the nitrate, acid sulphate, and hydrochloride, which are difficultly soluble, the first requiring 266 parts of water and 247 parts of alcohol at 70° F., the second, 427 parts of cold water, while the hydrochloride is the most soluble of the salts with the mineral acids, requiring only 121 parts of water and 205 parts of alcohol for solution. nitrate is so insoluble in excess of potassium nitrate solution that

^{*}American Journal of Pharmacy, 1879-p. 841,

tScattergood (Proceedings American Pharmaceutical Association, 1862), also Dr. Percy (Journal American Medical Association, 1864) had performed some experiments to determine the physiological effects of an alkaloid, and also a resin obtained from the drug. But as these investigations were instituted long before the chemical constitution of the drug was settled, they are not to be regarded as showing the physiological effect of the pure separated alkaloids. Dr. H. C. Wood, Jr., (Proceedings American Pharmaceutical Association, 1874) has also made some determinations of the physiological effect of jervine.

Bullock in American Journal of Pharmacy, 1875-p. 449, et. seg.

it is precipitated slowly but almost completely from solutions containing only one part in 1,200. According to Tobien, the acid sulphate has the composition C₂₇ H₄₇ N₂ O₈ H₂ SO₄, and the hydrochloride C₂₇ H₄₇ N₂ O₈ HCl. The best solvent for jervine is chloroform, while petroleum naphtha is the poorest solvent. This latter menstrum is poor for the purpose of extracting any of the alkaloids from the drug, and an attempt on the part of the writer to extract the alkaloids from a mass obtained by evaporating the fluid extract with magnesia yielded no alkaloids at all.

As these facts are the most important, we will next pass on to the rather limited results obtained by the writer. One of the chief sources of difficulty which was encountered in the examination of this fluid extract was the same as that met by all who have made any experiments and investigations on the drug, and this was the resinous matter which it contained. As already shown by Bullock, there is much danger of loss of alkaloids by their being enveloped in the insoluble resinous matter. is also another difficulty which complicates the matter, which is this: having the alkaloids in solution in either of the immiscible solvents-chloriform or amyl alcohol, which are the bestit is practically impossible to remove them by washing the solvents with an acid liquid in the manner of the most ordinary methods of analysis. It is particularly difficult by using water acidified with acetic acid, which latter acid is to be preferred in general, owing to the greater solubility of its salts with jervine. The writer has washed their solution in amyl alcohol with acetic acid as many as ten or twelve times before Mayer's reagent showed the alkaloids to have been completely removed. much trouble is encountered in removing them from chloroform, but even in this case repeated washing is required to effect the This difficulty was at first attributed to the retentive power of the resin over the alkaloids, but was afterwards found to be present in solutions wholly, or almost wholly, free from resin.

Jervine is probably the alkaloid which causes the difficulty, as it was found to be the case with an impure jervine obtained from the precipitated nitrate. Also it is worthy of note that

further experiments showed that chloroform (and probably amyl alcohol, will extract a portion of the alkaloids from solutions acidified with acetic acid or hydrochloric acid, might possibly serve as a basis for the partial separation of the alkaloids from one another. The first determinations of the alkaloids in fluid extracts were made by diluting 25 cc. of the fluid extract with 100 cc. of alcohol containing 10 cc. of a saturated acetate of lead solution, after thoroughly shaking together and allowing to stand for a few moments, the solution was filtered rapidly through a dry filter paper, taking 100 cc. of the filtrate representing 20 cc. of the fluid extract. removal of the lead by sulphuretted hydrogen the alcohol was removed by evaporation. To the residue was added a few drops of acetic acid and enough distilled water to make the solution measure 15 or 20 cc., which was then titrated with Mayer's reagent. Though the authorities state that acetic acid should be excluded from solutions to be titrated with Mayer's reagent, the writer could not in this instance perceive that it in any way affected injuriously the results, and as hydrochloric and sulphuric acids were objectionable on account of the slight solubility of their salts with jervine, (also in the case of hydrochloric acid with pseudojervine), and which would necessitate increasing the bulk of the solution very materially. In view of these facts acetic acid was given the preference.

It was noticed that the precipitate with Mayer's solution is either very unstable or it is much less soluble in water containing an excess of the reagent than in pure water, at least after adding the solution in excess and throwing on to a filter the filtrate which at first produced no further precipitate with the reagent, will, after washing two or three times with pure water, again begin to precipitate upon its addition. In order to obtain the jervine, the fluid extract was evaporated with magnesia and over the powdered mass, in a closed vessel, was poured a definite volume of chloroform, which after standing twelve hours was filtered rapidly through a dry filter paper taking an aliquot part of the filtrate, which was then evaporated to dryness and the alkaloid dissolved in acetic acid, filtered and the jervine precipitated from the solution by adding an equal volume of a strong

solution of nitrate of potash. The jervine nitrate was collected on counterpoised filter papers, dried at 70° C. and weighed While on the filter paper it should be washed two or three times with water containing nitrate of potash, and only once with pure water, as the precipitate is much more soluble in pure water than in water containing a quantity of the precipitant. Before drying, press the filter papers between blotting papers so long as moisture is absorbed. This process is not wholly satisfactory on account of the fact that there is some resin extracted by the chloroform which causes more or less loss of the alkaloids upon the attempt to dissolve the residue left by evaporation in acetic acid.

It was tried dissolving the mass in amyl alcohol and washing with acetic acid, but the result already mentioned caused a great bulk of the solution to be obtained, necessitating that it again be made alkaline, washed with chloroform, (to take up the alkaloids), which was then evaporated and the residue treated as first described. This procedure being too complex and tedious, still another was tried. 30 cc. of fluid extract are placed in a small flask and 10 grams of pumice stone are added, next add 120 cc. of a one-half per cent. solution of acetic acid, shake together and filter through a dry filter paper, taking 100 cc. of the filtrate equal to 20 cc. of the fluid extract. The acetic acid may be nearly neutralized with lime or magnesia and the solution then concentrated to a convenient bulk, made alkaline with ammonia and washed with chloroform. As there is a tendency of the matter in solution in the acetic acid mixture to deposit on the sides of the beaker while evaporating, this should be dissolved in ammonia and washed with a bulk of the solution as it contains small quantities of alkaloids. ings with chloroform are generally sufficient to remove the alka-The residue obtained by evaporation of the chloroform was then used either for the purpose of estimating the jervine from the weight of its nitrate or was titrated with Mayer's reagent. In the American Journal of Pharmacy, 1866, p. 98, Bullock records the fact that the resin obtained by precipitating the alcoholic tincture with acidulated water contains notable quantities of alkaloids. When the experiments last detailed were performed, the writer was not aware of the fact. The pumice stone had been particularly added to avoid any such difficulty, and at first was thought to accomplish its object, but further tests instituted since the results of Bullock's former experiments came to notice, indicate that this process also is attended with loss.

At the present writing time is too far advanced to permit of further work, and the writer feels that he must leave the matter in its present unsatisfactory state. Of all the processes, probably the one attended with the least loss is that by treatment of the alcoholic solutions with acetate of lead.

The results obtained by the writer are given in the following table:

No. of Sample.	•8p. Gr.	†O.c. of M's reag. req'd.	††Per cent. of jervine extracted from the drug.	††Per cent. of jervine in the fluid extracts.	Wt. of jervine nitrate obt'd.	Per cent. of total solids.
1	0.872	4.0				7.7
2	0.9654	3.2	0.225	0.233	0.051	7.7
8	0.8549	4.8	0.215	0.251	0.048	7.2
4	0.8923	6.0	0.425	0.476	0.095	9.2
5		5.2				6.9
6	0.8847	7.3	0.415	0.465	0.093	11.3
7	0.8854	10.0	0.430	0.485	0.0962	12.0
8	0.8730	4.5	0.215	0.246	0.0484	9.4
9	0.8679	7.0	0.280	0.322	0.063	
10	0.9007	11.1	0.255	0.283	0.057	

In the American Journal of Pharmacy, 1876—p. 280, is a paper by H. C. Schrack, on the alkaloidal contents of fluid extracts of veratrum viride and some other drugs. The investigator, in his experiments, proceeded to acidulate the fluid extracts, then evaporated to a syrupy consistency, diluted with

^{*}Taken at the temperature of the work room, 34° C., and compared with water at the same temperature.

[†]Required to precipitate all the alkaloids from 20 c.c of fluid extract.

^{††}Calculated on the supposition that the nitrate has the composition C^{27} H⁴⁷ N²³ O⁸ HNO⁸, and consequently contains 89.32 per cent. of alkaloid.

From 20 c.c. of fluid extract.

Numbers 1 to 8 were titrated after treatment with acetate of lead, etc., as already described, while the jervine was obtained by magnesia chloroform process, Nos. 9 and 10 were titrated, after the precipitation of the resin by dilute acetic acid, with pumice stone, etc.

water and filtered. The filtrate was titrated with Mayer's reagent, with results as follows:

No. of Sample.	Cc. Mayer's reagent,	Per cent. of alk. determ'd as veratriue.	Sp. Gr.
1	80.0	0.81	0.925
2	20.0	0.54	0.977
8	20.0	0.54	0.965
4	12.0	0.31	1.020
5	12.8	034	0.883
6	18.4	0.49	0.942
7	20.0	0.54	0.908

The second column gives the number of cc. of Mayer's reagent required to precipitate all the alkaloids from 100 cc. of fluid extract, and the percentage of alkaloids is reckoned on the titration equivalent of veratrine, but as this alkaloid is present in traces only, such results will be obviously misleading, and hence the numbers of cc. of Mayer's reagent given in the table have been divided by five in order to present the results on the same plan as my own, viz: showing the number of cc. of Mayer's reagent required to precipitate all the alkaloids from 20 cc. of the fluid extract:

No. of Sample.	Sp. Gr.	Cc. Mayer's reagent.
1,	0.925	6.0
2	0.977	4.0
3	0.965	4.0
4	1.020	2.4
5	0.883	3.7
6	0.942	8.7
7	0.908	4.0

These results are lower than my own, though they show wide variation in the alkaloidal power of fluid extracts of the drug. It is unfortunately not stated what acid was used in the acidulation of the fluid extract, nor what the degree of concentration of the solution which was titrated. Both of these statements would be of considerable value in enabling us to draw correct conclusions with regard to these results. Also the writer believes that there must have been loss of the alkaloids by being enveloped in the resin as has already been shown by Bullock, and also indicated by some of the writer's early experiments.

Query No. 29.

Solid Extracts vary greatly in Strength. What are the Causes of Variation, and how can Uniformity be Secured?

H. W. Snow, Ph. C.

The writer presumes that when this query was proposed it was chiefly for the purpose of enlisting interest and directing attention toward the subject, rather than in the expectation that a single paper would add greatly to our means of securing uniformity, which is the ultimate object in view. Already pharmaceutical literature contains all, or nearly all, of the material necessary to frame a reply to the question as to "the causes of variation," and thus in a measure answer the remainder of "how can uniformity be But in obtaining really practical data to standardize any individual extract there is required a careful study of the drug and of the extract before it can be accomplished. Although there are many drugs used in the form of solid extracts, of which our present knowledge is too incomplete to admit of standardizing, still the extracts of alkaloidal drugs usually present sufficient characteristics to make them fit subjects for investigation in this light.

It was the original intention, when this query was accepted, to perform work upon some one or more of the most important of the solid extracts by way of a practical illustration, but as various matters have prevented, it seems, perhaps, sufficient to answer it in a general way, and leave individual extracts as subjects for special work. Of the causes of variation, there are two which are particularly important, and which are the chief difficulties to overcome: (a) The natural variation in the strength of the drug; (b) the variation of the amount of extractive which different samples of the same drug will yield to a given menstruum.

The natural variation of drugs is well known and needs but little reference to, or illustration. The variation is great in many drugs, and it may be said that, in a general way, the proportionate variation is greater in drugs containing a small percentage of active agent than in those drugs containing a larger percentage of the proximate principle. In illustration we might take the drugs, belladonna leaves, belladonna root, coffee, nux vomica, guarana, and opium. Dr. Lyons* states that in a large number of assays of belladonna leaves he has found the percentage of total alkaloid to vary from 0.23 per cent to 0.87 per cent, and in leaves of the better quality has found the variation to be from 0.41 to 0.68. belladonna root he has obtained a variation of from 0.42 to 0.86 per cent. of mixed alkaloids. Thus the extreme variation of the leaves would be about 280 per cent, while in leaves of prime quality the variation is much reduced, showing only a fifty per cent. difference in strength. belladonna root it will be seen that about 100 per cent. variation occurs. The yield of caffeine from coffee of the better quality is given by Dr. Squibb, † as running from 1.05 per cent. to 1.30 per cent., and Dradendorff gives assays showing the amount to vary from 0.67 per cent, to 1.46 per cent., except in a single instance, where the percentage ran to 2.21 per cent. of alkaloid. In the first instance there is a variation of only 14 per cent., but as shown by the larger number of assays made by Dradendorff, and embracing all varieties, the variation is 100 per cent., omitting the single very high estimate of 2.21 per cent. Nux vomica contains, according to Messrs. Dunstan & Short, from about 2.74 per cent. to 3.9 of total alkaloid; while Dr. Lyons has found the drug to vary from 2.68 per cent. to about 3.47 per cent., except in a single instance, where 4.89 per cent. was obtained. In this drug we notice that, as compared with belladonna root or leaves, the variation is small, being only at the highest 82 per cent., and in general about 42 per cent. In summing

^{*}Paper read before the Am. Pharm. Ass'n, September, 1886.

[†] Ephmeris. ‡ Pharm. Jour. and Trans., Feb. 17, 1886.

[§] Proc. Mich. State Pharm. Ass'n, 1885, 174.

up the yield from guarana and opium, the same results will become apparent, the variation being only about 20 to 25 per cent. in both instances in samples of the better class. The wide discrepancies in the strength of these drugs will become more noticeable if they are stated in terms of yield per 10,000 pounds of drug. Thus belladonna leaves would yield from 23 pounds to 87 pounds of alkaloid, the root would furnish from 42 to 86 pounds, and so on with all the others.

These figures serve a twofold end, first, as indicating the higher proportionate variation in drugs containing small percentages of alkaloid as compared with those of higher alkaloidal content, and also show the wide difference of strength which is often found in different samples of the same drug. Passing next to the consideration of the matter of extractive, the first question which would propose itself would be, "Do we find the extractive yielded to a given menstrum, to vary to the same extent and in the same proportion as the active agent?" Some experiments recently recorded by Dr. Lyons* will answer this question and will be found to negative the supposition. He has recorded the examination of 12 samples of belladonna leaf in which the percentage of extractive yielded to 66 per cent. alcohol is stated, and also the percentage of alkaloid contained in the drug. The results were as follows:

No. of Sample.	Per cent. of extract to 66 per cent. alcohol.	Per cent. of alkaloid.	Equivalent per cent. of alkaloid in dry extract.	Per cent. of alk, in extract of pilular const'y !
1	20.5	0.42	2.05	1.64
2	19.0	0.41	2.15	1.72
3	30.7	0.42	1.37	1.10
4	25.5	0.41	1.61	1.27
5	23.0	0.40	1.74	1.20
6	21.0	0.68	3.24	2.59
7		0.51		
8	24.3	0.50	2.06	1.65
9	25.3	0.55	2.17	1.74
10	21.0	0.49	2.33	1.86
11	16.2	0.42	2.53	2.08
12	1.95	0.48	2.46	1.97
Average	22.4	0.47	2.16	1.71

^{*}Paper read before the American Pharmaceutical Association Sept., 1886.

⁺Supposing the extract to contain 20 per cent. of moisture, (volatile matter at temperature of water bath). See later on

Examination of this table will show that the highest per cent, of dry extract was obtained from sample No. 3, but this sample contains the same per centage of alkaloid as sample No. 11, which contains only 16 per cent, while sample No. 6 with 21 per cent. extractive contains the highest percentage of alkaloid of any given on the list, and sample No. 10 with the same per centage of extractive contains a percentage of alkaloid a little above the average. Looking at it from another view it will be seen that sample 11 with only 0.42 per cent. of alkaloid yields an extract inferior only to that obtained from sample No. 6 with 0.68 per cent of alkaloid.

The root does not vary to the same extent as the leaf, but still the variation is great. 12 samples of Belladonna root examined by Dr. Lyons yielded the following results:

No. of Sample.	Per cent. of extract to 66 per cent. of alcohol.	Per cent. of alkaloid.	Equivalent per cent. of alkaloid in dry extract.	Per cent. of alk. in extract of pilular const'y?
1	. 30.2	0.86	2.84	2.27
2	. 24.7	0.42	1.70	1.36
3	. 25.4	0.62	2.44	1.95
4	. 26.3	0.77	2.92	2.84
5	. 31.3	0.64	2.04	1.63
6	. 26.6	0.72	2.71	2.17
7	. 25.2	0.55	2.18	1.74
8	. 23.5	0.52	2.21	1.77
9	. 31.0	0.60	1.93	1.54
10	. 24.8	0.62	2.50	2.00
11	. 21.3	0.51	2.40	1.92
12	. 24.9	0.59	2.51	2.01
Average	. 26.26	0.62	2.365	1.89

In examining these last figures though we find in some instances a ratio existing between the extractive and the alkaloidal strength of the drug, still it is far from being uniformly the case. It now becomes apparent that it will be much more difficult to fix a standard and secure uniformity in a solid extract like that of belladonna than in one containing a larger proportion of alkaloid, as that of nux vomica for instance, belladonna extracts are stated to contain about 20 per cent.

^{*}Supposing the extract to contain 20 per cent. of moisture (volatile matter at t imperature of water bath). See later on.

[†]Chas. Ekin, Pharmaceutical Journal and Transactions, IV-p. 841.

water (matter volatile at temperature of water bath), while hyoscyamus extracts and conium extracts contain about 25 per cent. Accepting this as a standard the figures given by Dr. Lyons were calculated into percentages in extract of pilular consistency, which would lead us to expect a variation in the extract from the root of 1.36 per cent. to 2.34 per cent., while in that from the leaves we might expect to find 1.10 per cent. to 2.59 per cent.

LeRoy Webber,* gives a number of assays of belladonna extracts, the determination of alkaloid being made by Mayer's reagent after removal of much of the organic matter by strong alcohol and lime. The last samples were made from the inspissated juice.

1 2.57 2 2.51 3 2.34 4 2.38 5 1.84 6 1.80 7 1.80 8 1.70 9 1.48 10 1.41		Per cent.
3 2.34 4 2.38 5 1.84 6 1.80 7 1.80 8 1.70 9 1.48 10 1.41	1	2.57
4 2.38 5 1.84 6 1.80 7 1.80 8 1.70 9 1.48 10 1.41		
4 2.38 5 1.84 6 1.80 7 1.80 8 1.70 9 1.48 10 1.41	3	2.34
6. 1.80 7. 1.80 8. 1.70 9. 1.48 10. 1.41		
7	5	1 . 84
8. 1.70 9. 1.48 10. 1.41	6	1.80
9	7	1 . 80
9	8	1.70
10 1.41		
11		
12 0.90		
13		

These results will exhibit very clearly one of the difficulties of obtaining a uniform strength for a solid extract like that of belladonna. Take the strongest on the list and without the addition of a foreign substance it will be impossible to reduce it to an average strength as the amount of moisture allowed to remain must necessarily be limited in its variation, and on the other hand it will be still more difficult to bring those which are weakest up to an average strength, and it can only be done by the mixture with it of pure alkaloid or of an extract above the normal strength. However, if we know before hand what the yield of alkaloid is from the drug, also the percentage of

^{*}American Journal of Pharmacy, 1876-p. 256.

extractive it yields to the ordinary menstruum used in exhausting it, we can reduce these variations very materially by increasing or decreasing the alcoholic strength of menstruum used to extract it. This, of course, must be done with care, and done advisedly, as it is known that generally each drug is best exhausted by an alcohol of a certain strength. In illustration of this fact we can refer to the proceedings of this Association for last year where experiments of Dr. Lyons* on nux vomica were given, also results of work done by Messrs. Dunstan & Short†, and Conroy,‡ which show this result very clearly, and which indicate also how changing the alcoholic strength of the menstruum alters the yield of extractive.

Some experiments recently performed by Gibson§ show that in calabar bean, as in nux vomica, the percentage of extract increases as the alcoholic strength decreases, and consequently as the yield of extract increases its alkaloidal percentage decreases. Using the same drug in four experiments he obtained the following results:

Alco. str	ength instru	by um.	Extract obtained.	Per ct. alkaloid. in extract.
94 p	er ce	nt	. 1.32	5.00
66	"		. 4.56	2.60
58	"		. 5.62	1.80
53	"		. 9.44	1.20

It was not stated whether the extractive was reckoned as dry extract, or extract of pilular consistency. The writer was inclined to the opinion that a 66 per cent. alcohol was the best menstruum for exhausting the drug, and certainly these figures would seem to indicate that such opinion was proper. Some further assays of extract of physostigma, made by P. MacEwan, may be of interest in this connection.

^{*}Proceedings Michigan State Pharmaceutical Association, 18:5-p. 178.

tIbid from Pharmacoutical Journal and Transactions, December, 8, 1-88.

tibld from Pharmaceutical Journal and Transactions, December 15, 1883.

[§]Pharmaceutical Journal and Transactions, [3], XV -p. 593.

[,] Pharmaceutical Journal and Transactions, [3], XV .- p. 594.

	Per cent. total alkaloid.
1	10.47
2	5 66
8	5.45
4	8.94
5	3.87
6	6.60
7	1.60
8	1.10

In the preceding remarks the writer has often used the technicality "extractive" as applying to the total amount of nonvolatile matter yielded to a given solvent. It has, however, another and perhaps more general signification than the one in which it has been used in this paper; being applied to the principle (or principles) found in all plants which, though originally soluble, are modified upon heating their solution, finally becoming insoluble. It is well known that the air plays an important part in these changes, but in just what manner is not well It is stated that this same change takes place, though more slowly, in extracts of pilular consistency with a consequent impairment of strength, finally causing them to become inert or nearly so. The change goes on still more slowly in powdered extracts. This suggests another cause of variation with its remedy to a certain extent. Another circumstance worthy of note, which needs but to be mentioned, is the well known tendency of many extracts to absorb or give up moisture according to the varying humidity of the atmosphere. And lastly, it is stated that most extracts, when left to themselves, and particularly those containing nitrogenous principles, are capable of forming nitrates. This is an interesting fact if true, and though it would probably be extremely difficult to demonstrate experimentally, still our knowledge of the changes which go on in earth containing organic matter and under other somewhat analogous conditions indicate that it is not an unlikely change. It would be particularly interesting to know if, whether or not in extracts containing alkaloids, the nitrogen of the alkaloid is involved in this change, with a necessary decomposition of the alkaloid.

Enough has been quoted to show what are the chief causes of variation in the strength of solid extracts. Thus far nothing has been said of faulty manipulation, which of course plays an important part, but which need not be discussed further. it is not always easy to secure the same exactitude in the manufacturing laboratory as in the analytical laboratory; which fact of course must not be lost sight of in fixing standards. the preceding data the question of how uniformity may be secured in solid extracts is partially answered, as well as that of the causes of variation. The ultimate result of course can only be secured by assays carefully made. The necessary data for standardizing a solid extract, or prescribing a limit of variation, which latter will often be more easy to secure, would be about as follows: Obtain a number of reliable assays of the drug which will show about maximum, mininum, and average strengths; determine the alcoholic strength of the menstruum best suited to exhaust the drug; then find how the drug varies in its yield of dry extract with this menstruum; make a graduated series of determinations of the extractive yielded to alcohol of different degrees of strength, and lastly, assay a considerable number of commercial solid extracts, determining also the moisture (matter volatile at temperature of water bath), and calculating results both to extract of pilular consistency and to dry extract. With due caution in the preparation of the article and its preservation afterwards this will probably be found sufficient.

It will of course be found much more difficult to secure uniformity in solid extracts than in fluid extracts, unless a low standard is adopted and it be made permissible to add an inert diluent of some kind to lower the strength of those which exceed the limit of the standard. Abstracts, on the other hand, can easily be brought to uniformity. We have an instance of a standardized extract in the extract of nux vomica of the British Pharmacopæia (1885), which is required to contain exactly 15 per cent. of total alkaloids (strychnine and brucine). Messrs. Dunstan & Short chiefly performed the necessary experiments to fix this standard, and proceeded practically as detailed above.

Volunteer Paper.

What is the quantity of Caffeine in the Coffee of the Different brands in use in this State?

E. D. Smith, Ph. C. School of Pharmacy of the University of Michigan.

The process used is one given in Squibb's Ephemeris for 1884, pages 606, 637 and 641. It is a modification of Dragendorff's method. In substance it is as follows:

Take 10 grams of coarsely powdered coffee, mix it intimately with two grams of caustic magnesia; add this to 150 cc. of water; boil five minutes; percolate to 200 cc.; boil again with 100 cc. of water; percolate to 300 cc.; unite the two percolates and evaporate to about 20 cc. Add the 20 cc. thus obtained to 120 cc. of strong alcohol, which precipitates the pectinous matter, filter and wash the residue left on the filter with strong alcohol; evaporate off the alcohol from the united filtrate and washings; dissolve the remaining extract in successive small portions of water; transfer the resulting solutions to a separating apparatus and extract with chloroform.

The extraction with chloroform is accomplished by extracting three times, using 25 cc. of chloroform for each extraction. The chloroform is evaporated off and the caffeine weighed.

The results obtained by this method are as follows:

	Per cent.
Rio	1.3
Rio	1.185
Rio	1.03
Costa Rica	1.104
Porto Rico	885
Lanagra	1.02
Peaberry	897
Peduny Java	1.095
Maricaibo	
Savanillia	855
Mexican	603

It was found that little or no caffeine was lost by careful roasting. A sample of Peduny Java gave for the roasted coffee

1.15 per cent. caffeine, and a sample of the same unroasted 1.095. The loss of weight in roasting the berries was about one-sixteenth of their weight, which would about compensate their gain per cent. of caffeine over the same weight of unroasted berries.

Query No. 30.

What Medicinal Plants are Indigenous to the Vicinity of Ann Arbor?

By J. W. and W. P. Doty, of the class of 1886, and A W. SMITH and E. A. TUPPER, of the class of 1885, School of Pharmacy of the University of Michigan.

ANACARDIACEÆ.

Rhus glabra, L.—Smooth Sumach. Rhus typhina, L.—Staghorn Sumach.

ARACEÆ.

Acorus Calamus, L.—Sweet Flag. Arisæma triphyllum, Torr.—Indian Turnip. Symplocarpus fœtidus, Salisb.—Skunk Cabbage.

ARISTOLOCHIACEÆ.

Asarum Canadense, L.—Wild Ginger.

ASCLEPIADACEÆ.

Asclepias Cornuti, Decaisne—Common Milkweed. Asclepias incarnata, L.—Swamp Milkweed. Asclepias tuberosa, L.—Pleurisy-root.

BERBERIDACEÆ.

Caulophyllum thalictroides, Michx.—Blue Cohosh. Podophyllum peltatum, L.—May Apple.

CAPRIFOLIACEÆ.

Sambucus Canadensis, L.—Common Elder.

CISTACEÆ.

Helianthemum Canadense, Michx.—Rock-rose.

COMPOSITÆ.

Ambrosia artemisiæfolia, L.—Roman Wormwood. Erigeron Philadelphicum, L.—Common Fleabane. Maruta Cotula, De C.—Common Mayweed. Taraxacum Dens-leonis, Desf.—Dandelion.

CORNACEÆ.

Cornus florida, L.—Flowering Dogwood. Cornus sericea, L.—Silky Cornel.

CRUCIFERÆ.

Brassica nigra, Koch.—Black Mustard. Capsella Bursapastoris, Mœnch.—Shepherds' Purse. Dentaria laciniata, Muhl. —Toothwort. Nasturtium Armoracia, Fries.—Horseradish.

CUPULIFERÆ.

Quercus alba, L.-White Oak.

DIOSCOREACEÆ.

Dioscorea villosa, L.—Wild Yam.

EQUISETACEÆ.

Equisetum arvense, L.—Common Horsetail. Equisetum hyemale, L.—Scouring Rush.

FILICES.

Adiantum pedatum, L.-American Maidenhair.

GENTIANACEÆ.

Menyanthes trifoliata, L.—Buckbean.

GERANIACEÆ.

Geranium maculatum, L.—Wild Cranesbill. Oxalis corniculata, L. Var. stricta, Sav.—Yellow Wood-sorrel.

HAMAMELACEÆ.

Hamamelis Virginica, L.—Witch Hazel.

HYPERICACEÆ.

Hypericum perforatum, L.—Common St. John's-wort.

JUGLANDACEÆ.

Juglans cinerea, L.—Butternut.

LABIATÆ.

Brunella vulgaris, L.—Heal-all. Leonurus Cardiaca, L.—Common Motherwort. Mentha piperita, L.—Peppermint. Mentha viridis, L.—Spearmint. Nepeta Cataria, L.—Catnep. Monarda fistulosa, L.—Wild Bergamot. Nepeta Glechoma, Benth.—Ground Ivy. Teucrium Canadense, L.—Wood Sage.

LAURACEÆ.

Sassafras officinale, Nees.—Sassafras.

LEGUMINOSÆ.

Melilotus alba, Lam.—White Melilot.

LILIACEÆ.

Polygonatum biflorum, Ell.—Solomon's Seal. Smilacina racemosa, Desf.—False Spikenard. Trillium erectum, L.—Birthroot.

LOBELIACEÆ.

Lobelia syphilitica, L.—Great Lobelia.

MALVACEÆ

Malva rotundifolia, L.—Common Mallow.

ONAGRACEÆ.

Oenothera biennis, L.—Common Evening Primrose.

ORCHIDACEÆ.

Cypripedium pubescens, Willd.—Lady's Slipper.

PAPAVERACEÆ.

Sanguinaria Canadensis, L.—Blood-root.

POLYGALACEÆ.

Polygala sanguinea, L.—Milkwort. Polygala Senega, L.—Seneca Snakeroot.

RANUNCULACEÆ.

Actaea alba, Bigel.—White Baneberry. Anemone nemorosa, L.—Wood Anemone. Hepatica triloba, Chaix.—Liverwort. Hydrastis Canadensis, L.—Golden Seal. Ranunculus repens, L.—Creeping Crowfoot.

ROSACEÆ.

Potentilla Canadensis, L.—Five-finger. Prunus serotina, Ehrhart.—Wild Black Cherry. Potentilla fruticosa, L.—Shrubby Cinque-foil. Prunus Virginiana, L.—Choke Cherry. Rubus villosus, Ait.—Common Blackberry.

RUBIACEÆ.

Galium triflorum, Michx.—Sweet-scented Bedstraw.

RUTACEÆ.

Xanthoxylum Americanum, Mill.—Prickly Ash.

SCROPHULARIACEÆ.

Linaria vulgaris, Mill.—Toad-flax. Verbascum Thapsus, L.
—Common Mullein.

SOLANACEÆ.

Datura Stramonium, L.—White Thorn Apple. Datura Tatula, L.—Purple Thorn Apple. Solanum Dulcamara, L.—Bitter Sweet. Solanum nigrum, L.—Common Nightshade.

UMBELLIFERÆ.

Sium cicutæfolium, Gmelin.—Water-parsnip.

URTICACEÆ.

Humulus Lupulus, L.—Common Hop.

VIOLACEÆ.

Viola cucullata, Ait.—Common Blue Violet.

Query No. 19.

What is the Quality of the Citrate of Caffeine of the Market?

OTTO SCHERER, Ph. C., School of Pharmacy, University of Michigan,

There exists a good deal of contradiction as to the existence, or not, of caffeine citrate, and it may be interesting, perhaps, to give the references to some of the more important papers in which this matter has been discussed.

Among those who deny the existence of this salt we find: Roscoe and Schorlemmer, Vol. III, Part II, p. 334; Wittstein, Wiesner's Rohstoffe des Pflanzenreichs, 1871, p. 577; Ernst Schmidt, Bericht d. Deutschen Chem. Gesellschaft, Vol. XIV, p. 851; Günther, Journal für Practische Chemie, Vol. X, p. 273 Hager, Pharmaceutische Centralhalle, 1863, p. 853—1876, p. 418; C. Tanret, American Journal of Pharmacy, 1882, p. 494, and Joseph F. Burnett, Pharmaceutical Journal and Transactions, February 13, 1886.

On the other hand we have as many, and as good authorities, who acknowledge its existence and give methods for its preparation. We may cite: United States Dispensatory, p. 191; M. Hannon, Journal de Pharmacie, 1849, p. 355—1858, p. 123—reprinted in American Journal of Pharmacy, 1851, p. 158; Fehling, Handwörterbuch, Vol. II, p. 343; Ondray, Nouvelle Bibliotheque Medicale,—Magazine of Pharmacy, Vol. XIX, p. 49, and J. U. Lloyd, Pharmaceutical Journal and Transactions, 1880-81, p. 760.

Five samples of so called caffeine citrate were obtained and examined microscopically. Four of these could not be distinguished from pure caffeine, and moreover no crystals of citric acid could be detected. The other sample was granular, and had no definite structure, being totally different from caffeine. When a drop of water was applied to the powder on a slide, it dissolved readily, but immediately long slender needles would shoot out in every direction. These were undoubtedly caffeine crystals, and their formation can be explained as follows: this sample, as was confirmed by Lloyd's test, was caffeine citrate and, on dissolving in water, was decomposed, the caffeine, owing to its slight solubility in water, at once crystallized.

FFEINE CITRATES."	
CAFFEINE	
:	
OF	
ABLE	
\vdash	
COMPARATIVE	

	No. 8, Mixt. of eq'l parts of caff & citric acid	Caffeine dissolves, citric acid remains.	Acid.	156° C.	Granular.	Granular, with crystals of caffeine & citric acid	
COMPARATIVE TABLE OF "CAFFEINE CITRATES."	No. 7, Sample pre- par'd acc'd'g to J.U.Lloyd.	Like No. 1.	Acid.	159° C.	Granular.	Granular, with crystals of caffeine & citric acid.	
	No. 6, Caffeine.	Completelÿ soluble.	Neutral.	224° C.	Crystalline.	•	
	No. 5, European.	Completely soluble.	Neutral.	224° C.	Like caffeine, crystalline.	Like caffeine.	
	No. 4. American.	Completely soluble.	Neutral.	224° C.	Like caffeine, crystalline.	Like caffeine.	
	No. 3. European.	Completely soluble.	Neutral.	224° C.	Like caffeine, crystalline.	Like caffeine.	
	No. 2, American.	Completely soluble.	Neutral.	324° C.	Like caffeine, only finer.	Like caffeine.	
	No. 1, American.	Only a trace dissolves; with water about 1 half.	Acid.	160-161° C.	Granular white.	Granular, no crystals of caffeine or citric acid.	
		Solubility in chloroform.	Reaction of water solution.	Fusing point,	Appearance.	Appearance under the microscope.	

The fusing points of four of these samples were found to coincide with that of caffeine, viz: 224° C. Whereas the fifth had its fusing point at 160-161° C. A sample of caffeine citrate, prepared according to Lloyd's method, fused at 159° C.

Again, the above four samples were neutral and contained no trace of citric acid. The fifth, on treatment with water, became acid. The powder, treated with chloroform, yielded only a trace of caffeine; whereas, from a water solution, about 50 per cent of caffeine was extracted by chloroform.

It is evident, therefore, that four samples are nothing but caffeine; whilst the other contains about 45 per cent. of caffeine and 55 per cent. of citric acid, and is a definite compound, viz: caffeine citrate.

Query No. 43.

Examination of Commercial Salicylic Acid.

E. A. RUDDIMAN.

The object in this work was to determine to what extent the commercial samples of salicylic acid corresponded to the tests given in the United States Pharmacopoeia. Eight samples were examined with the results shown in table on opposite page.

The natural acid, when treated with potassium chlorate and hydrochloric acid, and then water of ammonia, gave as much color as the artificial acid, so that the color is due, not to carbolic acid, but to some other substance. This test depends upon the fact that when phenol is treated with chlorate of potassium and hydrochloric acid, tetrachlorquinone (C₆ Cl₄ O₂) is formed, which is a yellow compound soluble in water.

Volunteer Paper.

What is the Acid Strength of the Aromatic Sulphuric Acid in use?

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To determine whether the requirements of strength of the acid as given in the U. S. P. were too high or not, a sample was prepared according to the directions there given, and titrated with a volumetric solution of soda. The average of six titrations was found to be 36.18 cc.; thus, indicating that the standard fixed upon by the U. S. P. is not too high, at least for the acid when recently prepared. Theoretically, 38.4 cc. of the soda solution is necessary to neutralize all the acid present in 9.8 grams of the U. S. P. preparation.

Five samples of the acid were now obtained from the market and examined in the same manner as the preceding. In each case four titrations were made, and the average results were as follows:

No.	1,	required	24.96	cc. c	of volumetric	solution	of	soda.
66	2,	- "	25.79	46	"	"		66
"	3,	46	32.45	"	"	"		"
"	4,	"	25.37	"	"	"		"
66	5	46	35 36	66	66	66		44

In each case 9.8 grams of the acid were taken for the titration. Hence it is evident that none of the samples come up to the official requirements in strength.

Assuming, with the U.S. P., that 20 per cent of sulphuric acid in the Aromatic Sulphuric acid will be represented by 36 cc. of volumetric solution of soda, then;

No. 1 will be the equivalent of 13.86 per cent. sulphuric acid.

" 2 " " " 14.32 " " "

" 3 " " 18.03 " " "

" 4 " " " 14.00 " " "

" 5 " " " 19.36 " " "

This large variation must be attributed to careless preparation, rather than to any change brought on by time.

Query No. 5.

What is the Quality of the Iodoform in use?

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The Pharmacopeeia requires, that when iodoform is shaken with distilled water and filtered, the filtrate shall not change the color of blue litmus, and shall give no precipitate with a solution of silver nitrate (absence of iodides). Also upon full combustion, it should leave no residue.

Chlorides and sulphates are sometimes found as impurities of iodoform. To detect these agitate a small portion of iodoform with distilled water, filter after a few minutes and test the filtrate for chlorides with silver nitrate and nitric acid; and for sulphates with solution of barium chloride.

Picric acid, which may be present as an adulterant, can be detected according to the following method, given in the *Pharmaceutical Journal and Transactions*, vol. 14, p. 1047. To the filtrate, obtained as above, a solution of potassium cyanide is added, which produces no change if the iodoform is pure; but if it contains only a trace of picric acid, the solution acquires within ten minutes the red brown color of iso-purpuric acid.

Dr. Brouma, (American Druggist, 1884, p. 232), to detect the presence of impurities which have a toxic action, adds a little alcoholic solution of silver nitrate to the filtrate obtained as above, and sets the mixture aside for twenty-four hours, when, if any are present, a black precipitate of reduced silver forms.

Calcium iodate may be present in iodoform as a result of imperfect purification.

To estimate iodoform, treat ten grains of it, on a filter, with successive portions of ether till all the soluble matter is taken out. Allow the solution to evaporate spontaneously in a previously weighed capsule. Then weigh again.

Eight samples of commercial iodoform subjected to these tests, gave the following results:

	Per cent. of Iodoform obtained.	R	esidue r ignition.	
No. 1	96.31	not	weighe	$d \dots American.$
" 2	97.39		none	American.
" 3	98.73		"	European.
"4	98.02		"	American.
" 5	97.89		"	American.
" в	98.33		"	American.
"7	98.56		٠.	American.
" 8	98.41		"	American.

All when treated with water were neutral to litmus. The filtrate from each gave a very slight turbidity with silver nitrate, and none with barium chloride. Picric acid was not found to be present in any of the samples. With Dr. Broume's test, only Nos. 2, 3 and 4 gave a precipitate of reduced silver.

Query No. 45.

What Improvement, if any, can be Made in the Present Pharmacopeial Preparation of Fluid Extract of Ergot?

E. C. FEDERER, PH. G.

It being now generally acknowledged that those principles discovered by Prof. Dragendorff, and named sclerotic acid, with the scleromucin, with possibly those water soluble substances of different authors and called ergotin, are the medicinal substances desired from ergot; to the exclusion of the nearly inert fatty oil, as well as the insoluble poisonous alkaloid ergotinina, the volatile alkaloid trimethylamine, although not specially spoken of as being one of the necessary substances to the action required or said to come from ergot will be found an integral portion of the whole in the preparation where such a menstruum is used which will act with best solvent power on those substances desired as above, by the aid of fixing acid of course.

These substances all being quite readily and easily soluble in weak alcoholic menstrua it must seem that the above query can best be answered by investigating as to whether it is best to deprive the drug of its fixed oil; if it is necessary to use glycerin with reference to its preservative as well as to its solvent properties; and lastly what percentage of alcoholic strength in menstruum is the best calculated for exhausting and finally preserving the drug in its finished state of fluid extract.

With this view of the subject in question, the following experiments were made: 100 ounces of sound first-class Spanish ergot was repeatedly macerated, then percolated till no more fatty residue was left from a small quantity of the final percolate on evaporation, the solvent being petroleum benzin.

The evaporated and united percolates were heated to procure a residue of constant weight and till no more benzin odor was apparent, leaving a cold residue of fatty oil weighing only about 13.30 per cent; a much smaller yield than is accorded to ergot in any text book the writer has seen. The only way the writer can account for this is, if the text books are correct in all instances, it must be because maceration was conducted, as well as percolation, during the cold weather of last winter, and in a cupboard exposed to this temperature which never exceeded $+50^{\circ}$ F., nor went lower than +5° F. to 0 F. This might account for the small yield, leaving possibly in the residue those matters (fatty oil) having the higher or more weighty molecule (stearin) or oil analogous to it. It would be well to say here that the ergot was not very oily, that it was readily ground to a fine or tolerably fine powder, had no rancid odor, and in cold weather a short fracture easily breaking up without elasticity. If the books are not always correct, or if the quantity can vary so much as this did, would it not be on account of new fresh ergot? my experiments a menstruum was used to prepare a fluid extract, containing 33 per cent. strong ether by vol. to see if this menstruum would extract more of the oil, (the 67 per cent. remaining in the menstruum was alcohol 95 per cent.)

This oil only thickened up, when exposed to $+20^{\circ}$ F; has a sp. gr. .925 when warmed to $+60^{\circ}$ F; it is clear, pale yellow without action to test paper, slightly soluble in strong alcohol,

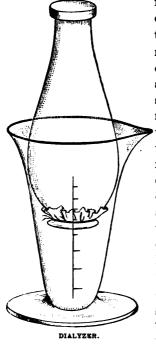
very soluble in ether, chloroform and carbon bisulphide. When agitated repeatedly and decanted from weak muriatic acid, about 5 per cent., the decantates united and acted on by Mayer's test, (sol. Iodohydrargyrate Potass.) a very small precipitate separated, brownish color, and on a white filter when washed and condensed to small surface was much darkened; this was soluble in strong alcohol; the quantity being very little, there was nothing more done with it.

The residue from benzin solvent was divided into five equal portions and 20 ounces of the fat-containing drug, (which is equivalent to the 5th of that which was deprived of oil), were packed into percolators, making six experiments, were macerated for an equal length of time and percolated till exhausted. In those operations or experiments where glycerin was used, it was only in the macerating menstruum, which menstruum was in every instance 20 fluidounces, this was followed by the same menstruum minus the glycerin; when acetic acid was used it also was used only once and that time for the macerating menstruum, as above, its quantity was a like percentage as in Ext. Ergotæ fl. U. S. P. 1870.

The quantity of menstruum required to effect exhaustion was noted each time, the sp. gr. of the fluid extracts noted, the amount of solid residue from 10 fluid-drachms evaporated to constant weight, the temperature never exceeding +160° F. In the cases where glycerin was used in macerating menstruum, percolation was kept up till no more glycerin taste nor hygroscopic residue was left from the evaporated residue of a small quantity of percolate in the tailings, this was considered fair, if not accurately correct, at least proximately so, for calculation of difference in solid extract from 10 fluid-drachms. A seventh experiment, U. S. P. 1880, was made for comparison, on 20 ounces of ergot with its fat, employing the same alcoholic percentage menstruum, using acetic acid instead of muriatic acid as per U. S. P. '80.

Ten fluidounces of each was used for dialysis for comparative estimation of scleromucin and sclerotic acid, dialyser constituted of a lamp chimney with flange, with septum of parchment doubly folded and tied securely over, the top covered with a tin box cover and this placed over and just into distilled water con-

tained in equal sized glass graduates. (See illustration.) The



fluid extract was evaporated in all cases to expel alcohol and the quantity made up with dist. water, to original 10 fluidounces, and all allowed to diffuse into 17 fluidounces of water, as long as diffusion was seen to go on, so long or often was the diffusate renewed once daily (every 24 hours) with the original amount of dist. water (10 fluidounces.) In some cases mould appeared which was quickly checked by dropping on to it a few drops of alcohol if over the septum, and if under the septum the diffusate was quickly removed, and a few drops of alcohol added. Evaporation was kept up till the last addition was freed from crystalloid in case of the diffusate (which was readily seen through glass graduate); at no time did the temperature go beyond or outside of these limits $+10^{\circ}$ F. to $+160^{\circ}$ F,

and this was conducted in porcelain capsules, previously tared, after properly drying by heat and cooling, weight was calculated when found constant in three weighings, after which the colloid solution was in like manner washed clean into like capsules and evaporated to constant weight at $+160^{\circ}$ F. or less.

The crystalloids and colloids, when thus obtained, were properly kneaded with the requisite amount or percentage alcohol, according to Prof. Dragendorff, only twice, for partial purification, this being a comparative line of experiments, good practical approximate results seemed all sufficient, everything being as nearly equal as possible for each one experiment.

The filtrate from alcoholic kneading process were evaporated to free them from alcohol and all brought to about the same value after concentration, shaken up with ether, this decanted, evaporated and weak muriatic acid added, lastly Mayer's reagent applied for ergotinine; in no case was there any precipitate.

EXPERIMENTS ON ERGOT.

Nos.		MENSTRUUM USE! (Parts by volume.)	MENSTRUUM USED. (Parts by volume.)		Quantity required to	Sp gr. of	Quantity Sp gr. of Residue from	Minus Glycerin. Scieromucin. Scierodic Acid.	Scieromucin.	Scierotic Acid.
i	Ether.	Alcohol	Glycerin.	Water.	exhaust.	Fl. Ext.	f. 3 X.			
*	Parts -	Parts - Parts 24 (+ HCl) Parts 24	(+ HCl)	Parts 24	5113	1.0000	80 grains.	80 grains. (No glycerin.)	10 grains.	178 grains.
ţ	1	_ _	Parts 1	ń	55 f 3	1.0550	130 grains.	424 grains.	424 grains	85 grains.
3‡	ı	-	-	 •	55f3	1.0900	130 grains.	42½ grains.	26 grains.	166 grains.
#	•1	1	es.	9	55 f 3	1.1150	200 grains.	25 grains.	164 grains.	345 grains.
5**	1	લ્ય	With Ame's	90	5513	1.0600	110 grains.	110 grains. (No glycerin.)	334 grains.	114 grains.
1+9	1	र्दे	ı	**************************************	55 f 3	1.0000	100 grains.	100 grains. (No glycerin.)	20 grains.	109 grains.
#	က	ţ-	1	l	55 f 3	.8675	230 grains.	Mostly fat.	4 grains.	5 grains.

REMARKS.

+ Dialysate turns mouldy, (10 f. dr. F. E. weigh 560 grains.) ## Dialysis very slow, 10 f. drachms, F. E. weigh 450 grains. ** Colloid and crystalloid solutions turn mouldy. (See residue.) + Dialysus slow, 10 f. 3 F. E. weigh 560 grains. ‡ Dialysuse moulds readily, (10 f 3 F. E. weighs 580 grains.) 10 f. dr. weigh 590 grains. * Dialysis quite slow.

Nos. 1, 2, 3, 4, 5 on fat extracted ergot.

No. 7, Etherial menstruum on fatty ergot.

No. 6, U. S. P. process on fatty ergot for comparison with No. 1.

No. 1, U. S. P. process on extracted fat; acetic instead of muriatic acid.

No. 3, menstruum contains U. S. P., '70 proportion acetic acid.

No. 4, menstruum contains U. S. P., '70 proportion acetic acid.

No. 5, menstruum contains U. S. P. Aq. Ammonia $6\frac{1}{2}$ fluid-drachms to $20f\frac{\pi}{2}$.

Nos. 2, 3 and 4 contain glycerin in menstruum, and No. 4 twice as much as either; Nos. 2 and 3 and this No. 4 experiment shows most sclerotic acid of all the specimens, glycerin seems by above to be either the best solvent for sclerotic acid or that the only partially purified sclerotic acid in No. 4 contained some glycerin, twice kneading with 80 per cent. first and 75 per cent. alcohol next, seemed to be sufficient to abstract most of the glycerin and at the second time to precipitate the sclerotate nearly pure.

Nos. 2 and 5 contained in menstruum equal amounts alcohol, but No. 2 contained glycerin and this No. 2 experiment contains the largest amount of scleromucin; in this case glycerin seems to be advantageous here also; No. 4 contains no alcohol, but the largest amount of glycerin, therefore, here also you see the largest amount of sclerotate, it seems in favor of glycerin. No. 4 contained no alcohol and the largest amount of glycerin, it shows the least residue of all from 10 fluidrachms of fluid extract; Nos. 3, 5 and 6 turn mouldy, and of these No. 3 contains a small amount of glycerin, the Nos. 5 and 6 none at all; glycerin here seems to be beneficial as antiseptic or preventive to mould.

No. 1 U.S. P. process on fat free ergot when compared with No. 6 U.S. P. process on fatty ergot, shows more favorably towards yield of scleromucin and sclerotates in the fat freed ergot, but in residue from 10 fluidrachms of fluid extract; that

containing the oil in the drug has the highest figure when compared with all the rest except the No. 5, in which the drug was freed from fat and no glycerin was used.

Four fluidounces were reserved of each to note any effect as to stability, rancification, fermentation, moulding or precipitation, a few weeks after handing in my paper they were all united, and on this part of the work there are no more data. In the experiments numbered from 1 to 7, not having all the data to rewrite this paper, (the original copy of which was lost,) you will please excuse omissions.

The conclusion the writer would come to is that it is beneficial to use naphtha (petroleum benzin) to remove fat if at all practical, but to macerate and percolate in warmer locality than out doors in mid-winter; we had to do our work in this respect as to cold and outdoor cupboard, on account of not being allowed to use inflammable ethers in the laboratory. Glycerin as part of menstruum seems to be advantageous, inasmuch as its best showing is in the highest yield of sclerotic acid.

From my remembrance as to keeping properties from those fluid extract reserved and lately united and disposed of, it seems alcohol, when of not more than 25 per cent. in menstruum, is essential as solvent and preservative.

There being nothing more of particular interest, I close, with the opinion (from the experiments as conducted on this plan), that if ergot, of good quality (new and free from rancidity) is deprived of its oil, is used and at least 25 per cent. by volume in glycerin as macerating menstruum with not more than 25 per cent. alcohol, and the avoidance of heat as much as possible, a product is obtained superior to that of the U. S. P. process.

P. S.—Those washings or liquors from kneading the sclero-mucin and sclerotates, when acted on by Mayer's reagent, gave considerable dark brown precipitates in both cases for all the experiments except No. 7, or the Etherial Fluid Extract, and this No. 7 gave a larger amount of solid residue from 10 fluid-drachms of the fluid extract, which contained much fat. No. 5 contained ammonia; muriatic acid was added previous to Mayer's test to just acid reaction.

Query No. 56.

What Improvement can be made in the Estimation of Alkaloids by Mayer's Reagent?

VOLUNTEER PAPER.

A. B. LYONS, M. D.

Although we are promised a paper in answer to the above query, the subject is one not likely to be exhausted in a single paper, and it is one of such general interest that I have thought myself justified in contributing to its elucidation the results of my personal observations and investigations.

The assumption that underlies the method of volumetric estimation of alkaloids by this reagent is that the precipitate produced by it is a definite chemical compound, of invariable composition, so completely insoluble in water that no appreciable quantity of the alkaloid can remain in solution in presence of any excess of the reagent. Conditions such as these obtain in the case of many reactions between inorganic salts, and under such conditions alone can volumetric estimations give us satisfactory and constant results.

The first object of my experiments was to ascertain to what extent the precipitation of alkaloids by Mayer's reagent conforms to these conditions. In a paper published some twenty years ago,* Thomas B. Groves pointed out the circumstance that in titrations with Mayer's solution a point would be reached before precipitation ceased when the filtered fluid would cause a precipitate in a fresh solution of the alkaloid, showing that there is present already an excess of the precipitant. Mr. Groves made the observation that after standing some time this apparent excess of reagent disappeared, showing that the reaction is not instantaneously completed, or possibly that an intermediate soluble compound is first formed which subsequently takes up a larger proportion of the alkaloid, frequently producing in this manner crystallized compounds.

My own observations, made at first in ignorance of Mr. Grove's paper, are confirmatory of the earlier ones. I found

^{*}Pharm. Journal, II., 6, p. 268.

that in the case of many alkaloids, the solution would begin to show apparent excess of reagent when scarcely half the quantity had been added necessary for complete precipitation. The larger the quantity of fluid present, the larger the amount of this excess, which, it seems, must form a definite proportion of the entire fluid. The practical deduction from this observed fact is, that the titration equivalent of any given alkaloid varies with the degree of dilution of the solution. If it is fixed for a solution, e, g, of 1:200, a correction must be made in titrating more dilute solutions, not additive, as most writers represent, but subtractive. These corrections can, of course, only be found by observation.

My experiments, whose results are given in the following tabulated statement, aimed to gather data on which to base a formula for correcting the results of a titration, and further to study the influence of some other variations in the conditions such as the presence in the solution of alcohol or glycerine, etc.

The table, which includes the results of numerous experimental titrations with a few of the more important alkaloids, is to a large extent self-explanatory. Column 1 gives the name of the Column 2, any especial conditions, such as presence or absence of acid. Column 3 gives the quantity of reagent required to produce an apparent excess, so that the filtered fluid will give with a solution of the alkaloid a faint precipitate. Column 4 gives the quantity of reagent added before testing whether there were an excess or not, the test showing large Column 5, the quantity of reagent added when the effect of adding a drop or two more was only to produce a Column 6, the quantity required to complete the slight cloud. precipitation. Column 7 gives the excess of reagent present in the solution at the close of the titration. Column 8 gives the corrected result of the titration, i. e., the difference between the figures in column 6 and in column 7.

The modified reagent No. 1, differed from Mayer's reagent $\frac{N}{20}$ only in containing five molecules of potassium iodide instead of three. Modified reagent No. 2, contained the usual quantity of mercury, but a minimum amount of potassium iodide.

	1	7.45 E.A		Ms	yer's Soli	ition, 1-20	Normal.	
Name of al- kaloid, 0.100 used in each experiment.	Especial conditions.	Propor- tion of al- kaloid in solution tilrated.	Required to give apparent excess.	l griving	Produces only slight precipit.	Required for com- plete pre- cipitation.	Excess at end of titration.	Actually consumed
Aconitine (Merck's		1:200			6.2	7·3†	2.2	5-1
Aconitine,	•	1:200	3.3		6.0	6.52		
Atropine		1:400 1:200 1:200 1:200 1:400 1:600	8·5 5·2	8° 7°1 7°0 7°6	5.9	6·3 13·1 14·9†† 13·6 14·0†	3·0 4 3 4·0 3·5 5·6	10·1 10·9 9·6 10·5 9 4
"	Modified re- agent No. 1	1:200	5.5			11.2	2.8	8.4
66 66	Modified re- agent No. 2	1:400 1:600 1:400		8· 7·2		11.6 10.8 12.9†	8·2 2·6	8·4 8·2
Berberine 	Modified re-	1:200 1:400 1:600 1:200				3·7 3·8 4·2 to 4·6 3·8	02	8.5
44 44	agent No. 1 Modified re-	1:400 1:400				3·8 6·0 to 7·2		
Brucine (Commer- cial)	agent No. 2 Sol. slightly acid	1:200			7.6	8:0†	1.7	6.8
••	Sol. nearly neutral.	1:200	5·1		6.4	6.9	0.9	6.0
Brucine (Commer- cial)	Sol. quite neutral	1:400 1:400	6.0	6.8	8·4 7·6	8· to 9·2†		
"	Sol moder- ately acid	1 · 400			8:0	9. to 9.8†		
•	Sol. nearly neutral. Mod. reagt.	1:600	6.0	4.8		9 2† 6·	1.8	5.7
"	No. 1.	1:400		6.	7.2	7:6		37
**	KI, 08 add- ed.	1:400		4.8		6.8		
"	25 per cent. alcohol present †	1:400 1:400		5.8	5.2 8.	5·67 9· to 10·†		
Brucine (Merck's pure)	Sol. faintly acid	1:400 1:400		6.4	10· 9·6	11·2† 10 0		
pure)	Sol. neutral 25 per cent.	1:400 1:400			11·6 12·0	?† 13·2†		
"	alcohol pre- sent. Sol. acid, 25 per cent. al- cohol pres-	1:400			11.2	11· 6 †		
Cinchoni- dine	ent	1:100	12.4			13.8	1.0	12.8
" "	Mod. rea-	1:200 1:200 1:200	11.2			15·6 18·5 12·8*	2·6 0·7	13·0 12·8
Cinchonine	Mod. rea- gent No. 1 Sol. quite neutral	1:200	7.9			10.8		
"	Sol. quite	1:200		12.8		14.2		

Name of al- kaloid. 0.100		43 5 5 5 S			<u> </u>	tion, 1-20 no		
kaloid. 0.100 used in each experiment.	Especial conditions.	Proportion of al- tion of al- kaloid in solution titrated.	Required to give apparent excess.	giving	slight	Required for com- plete pre- cipitation.	Excess at end of titra- tion.	Actually consume
	Sol. strong- ly acid. Sol. neutral	1:200	12.0		17:4	19:4†		
"	Sol. neutral	1:400	8.0	1	ł	12·4 14·0	2.4	10-0
"	Sol. acid Sol. strong- ly acid	1:400 1:400	10·0 11·5			14 0*		
	Mod. rea- gent No. 1	1:200	7:0			8.4	0.40	
"	"	1:400 1:400	7·1 8·8		12.4*	9·4 16·0 	8.6 8.6	8·6 12·4
66	sol. acid Mod. rea- gent No. 1, 25 per cent. alcohol	1:400	6·2			11.6		
Cocaine		1:25				9.0		
44 44	Sol. neutral Sol. acid	1:200 1:200 1:200	7.2			9·7 10·6 12·1•	0·7 1·1	90 95
"		1:300			12.4	13.20		
"	Sol. nearly neutral	1:400 1:400	10.0		12.8	14·4 15·2	4.6	9-8
"	Heres	1:600		14.0		16·0 †	5 2	10-8
"	Mod. rea-	1:600 1;200	8.		14·8 9·2	15·2 9·6		
-	gent No. 1	1:200				11-2	1.8	9.4
"	2 per cent. KI present	1:400 1:200		11.2	12·0 9·2	14·4 11 3†	4.1	10.3
"	8 per cent. KI present	1:300			9.6	11 2†		
"	8 per cent. Ki present	1:600			12.8	14 4		Ì
"	4 per cent KI present	1:600			11.6	13.2		j
"	5 per cent. KI present	1:600			10.8	12.8		
"	Mod. res-	1:200				12-2	16	10 6
"	gent No. 2 20 per cent. alcohol	1:400				14.5		
"	present 20 per cent. glycerin present	1:400				13-4	•	
Colchicine (Merck's)	present	1:300			9.2	10·1 to 11·0 1		
(Moior b)	Mod. rea- gent No 1	1:400	2.5		8.0	9:24		1
Colchicine Crude from colchicum	SOLUTIO 1	1:200	3.2			9·2		
seed)		1:300	4.0	1	9.0	10.2		l
"		1:400	_	6.	9.6	10 to 12+		
"		1:600 1:800	4.0	5.	8·6 12·6	11.5to12.5† 14. to 15.†		
Emetine		1:200	8.0		8.8	92 to 98		81
"		1:400 1:600	8·5 9·2	1	10· 0	10·2 10·6	1·0 0·6	9-2
ü	Mod. rea- gent No. 1	1:300	""		ł	9.4	0.6	8.8
"	gent No. 1 Mod. rea-	1:800			Ì	11-2†		
Gelsemine	Mod. rea- gent No. 2 Sol. faintly	1:200		5.8	9.6	10-0		
"	acid Sol. acid Sol. more	1:200 1:200	3·8 3·8		9·8 10·2	10·4 10·8		
"	acid Sol. faintly	1:400		8.0	9.6	11·2 to		
	acid	1.200		1	1	12.0		1

		.4864	Mayer's solution, 1-20 Normal.							
Name of al- kaloid, 0.100 used in each experiment.	Especial conditions.	Propor- tion of al- kaloid in solution titrated.	Required to give apparent excess.	Added, giving large excess.	only slight	Required for com- plete pre- cipitation.	Excess at end of titra- tion.	Actually consumed.		
Hydrastine "" "" Hyoscya- mine (Merck's		1:100 1:200 1:300 1:400 1:600 1:200				7·2 7·4 7·8 8·2 8·4 9·2				
cryst.)	Mod. rea- gent No. 1	1:200		6.8		8.5 to 9·1†		6.7		
"	Sol. neutral Sol. acid Sol. neutral Mod. rea- gent No. 1	1:200			6·6 7·0 6·9	7·8 8·6 9·1† 8·8	0-6	8.2		
Pilocarpine	gent No. 1 Titrated without fil-	1:200 1:200 1:200	4.8		16·4 	18 8 19·4 21·4†	2·3 1·4	17·1 20·0		
"	tration Mod. rea- gent No. 1	1:200	9.		14.0	15-2	1.6	18.6		
Quebracho alkaloids		1:200 1:200 1:400			13.6	14·3++ 8·2 to 8·6	1.4	12-9		
"	Sol. slightly acid Sol. more acid.	1:400				10.4	1.0	9:4		
"	Sol. slightly acid.	1:600				11.2		•••		
Quinine	Sol. neutral "acid	1:200 1:400 1:400 1:400	8·8 11·6 12·0	12.8	14·0 15·1 16·0	15·5 16·8 16·0 18· to 19·†	2·7 3·4	12·8 12·6		
	Mod. reag't. No.1 neutral Mod. reag't.	1:400	12-6	10·5		12·5 13·0 ++				
	No. 1 acid Mod. reag't. No.1 strong-	1:400	18-++			19·§				
	ly acid Mod. reag't. No. 1, 25 per cent. alco-		9-5			12·4 ††				
Strychnine	hol.† Sol. neutral Sol. acid "more" "neutral "acid	1:200 1:200 1:200 1:400 1:400	11·2 11·0 11·4 ##		12·2 11·4	14·0 11·0 11·8 12·0* 11.6†	0·8 0·3	10·4 11·5		
	" more " Mod.reag't.	1:400 1:200	11·4 10·4		12 0 11 6	12.8	1			
	No. 1 Mod. reag't. No. 1 acid	1:400 1:400	11·2 11·2		11.6	18·6 12·0	ļ			

[†] End of reaction not well defined.

[†] Modified reagent No. 1.

Precipitate forms distinct crystals.

Precipitate forms and redissolves, more reagent again producing precipitate.

In all the experiments 0.100 Gm. of alkaloid was used, and the reagent employed was of one half the strength of Mayer's solution. It was therefore $\frac{1}{2}$ normal strength, instead of decinormal. This is the most convenient strength for ordinary work, and confusion would be avoided if hereafter this solution should be always understood when Mayer's reagent is spoken of. To make it clear, however, that this solution and not the stronger one is meant, it would be well to specify $\frac{N}{20}$ or $N_{\frac{1}{2}0}$ although even then there is a possibility of misunderstanding, since some chemists insist on a full molecule in the "normal" solution. I follow Sutton in giving the name to a solution containing a quantity of any salt equivalent to a molecule whose electropositive is a monad.

Aconitine.—Titrations give pretty uniform results. The end of the reaction is generally quite sharply defined, and dilution has less influence than in the case of most alkaloids.

Atropine.—Results of titrations vary greatly with different samples of the alkaloid, and are much influenced by variations The end of the reaction is never very sharply After reaching a certain point, it will be found that a drop of the reagent will produce a precipitate which immediately re-dissolves, while addition of several drops will produce a distinct precipitate. If collected at once and weighed, the precipitate will be found to fall much short of the theoretical weight, whereas if allowed to stand a few hours, it becomes firmly adherent to the sides and bottom of the containing vessel, but has a resinous appearance; its weight is then near what theory requires. I have not observed in this precipitate any tendency to crystallize; most of my experiments were made with commercial atropine. A sample of Merck's pure atropine showed an exaggeration of the peculiarities noted above.

From the experiments above, we may deduce the following practical rule for interpreting the result of a titration of this alkaloid with Mayer's reagent, N $\frac{1}{20}$. For each cc. of fluid present at the end of the titration deduct from the quantity of reagent consumed 0.05 cc. and multiply the remainder by 7.5. The product will be the quantity of alkaloid present, expressed in milligrams.

If the modified reagent, No. 1, is used, its equivalent may be taken as about 8.7 milligrams, the dilution of the alkaloidal solution being between 1:200 and 1:400. The results, however, are liable to considerable variations, and the ordinary reagent is probably to be preferred. If the excess of reagent is estimated and deducted from the amount consumed, the equivalent becomes, where the ordinary reagent is used, about 9.5 to 10 milligrams; with the modified reagent, No. 1, about 12 milligrams.

Brucine.—Results of titrations vary widely and apparently capriciously under varying conditions. In solutions exactly neutral, a larger quantity of reagent is required than in those containing a little acid, the end of the reaction being ill defined. On the other hand, addition of more acid, a small proportion after all, gives a high figure for the titration. The alkaloid is so easily estimated by other methods that the use of Mayer's reagent cannot be recommended where this alkaloid is in question, e. g., in the examination of preparations of nux vomica and ignatia.

Berberine. — Mayer's reagent produces in solutions of berberine, as in those of morphine, a bulky crystalline precipitate. The titration equivalent of the alkaloid is remarkably high. Results of titration in solutions 1:200 to 1:400 are reasonably self-consistent, but the alkaloid is nearly always associated in the plants in which it occurs with at least one other alkaloid having a very different behavior, and the estimation of berberine by a colorimetric method is so easy that titration will not often be practiced. It is noticeable that very little excess of reagent is required in this titration, and the alkaloid might therefore perhaps be used to estimate excess of reagent, but has no advantage probably over strychnine.

Cinchonine and cinchona alkaloids generally do not give satisfactory titrations. Variations in the proportion of acid present produce very great variations in the results obtained.

The modified reagent No. 1 may be advantageously used, provided the end of the reaction is taken as the point when a single drop of reagent produces a cloud which completely

clears up. The presence of a certain proportion of alcohol in the solution is favorable also, in that it cuts short the operation at a point that is near the normal end. These alkaloids, however, are easily estimated gravimetrically, and there is no occasion to resort to the volumetric process. In roughly estimating the amount of alkaloid in a fluid extract or tincture, an arbitrary equivalent may be assumed for Mayer's reagent, but experiment shows that this must be a very low one, viz., not far from five milligrams.

Cocaine.—The titration is much influenced by the degree of dilution of the alkaloidal solution; less by variations in the proportion of acid present. Titrations of solutions prepared from fluid extracts or tinctures give results by titration much above those obtained by extraction of the alkaloid. The results of titration may be interpreted, when we are dealing with the pure alkaloid, by the following rule: Deduct from the observed result for each cc. of fluid present at the end of the experiment 0.085 cc., and multiply the remainder by 10, to obtain the quantity of cocaine in milligrams.

Colchicine can be satisfactorily estimated by Mayer's reagent, provided there is present in the solution a somewhat large proportion of free acid. It requires that about 10 per cent. of the solution shall be dilute sulphuric acid (one volume of acid in five). Under this condition, the results of the titration are to be interpreted by the following rule: Correct the result by subtracting for each cc. of fluid present at the end of the titration 0.08 cc., and multiply the remainder by 29, to obtain the quantity of colchicine in milligrams.

Emetine may be estimated with Mayer's reagent with a fair degree of precision. Correct the result by deducting for each cc. of fluid present at the close of the experiment, 0.038, and multiply the remainder by 12, to obtain the quantity of alkaloid in milligrams.

Gelsemine gives us results which vary considerably, especially with the degree of acidity of the solution. The titration method is, however, a useful one in the case of this alkaloid, because it is somewhat difficult to separate it in a pure condi-

tion, and the quantity contained in the drug is at most small. If the solution contains 1:200 of alkaloid, the titration equivalent may be taken as 9.5 milligrams.

Hydrastine.—Results vary greatly according to the degree of dilution of the solution. It will rarely be advisable to attempt estimation of the alkaloid by titration. The following rule may, however, be formulated: Correct the result by subtracting from each c.c. of fluid present at the close of the titration, 0.025 c.c., and multiply the remainder by 14.9, to obtain the quantity of hydrastine in milligrams.

Hyoscyamine resembles atropine in its behavior. The number of experiments made with it was not sufficient to serve as a basis for any useful deductions. It must be understood, of course, that this alkaloid is one only of the active constituents of heubane, possibly the least important one.

Morphine.—In solutions containing 1:200 to 1:400, Mayer's reagent produces a white precipitate which momentarily takes on a yellowish shade, and the whole fluid then sets into a translucent jelly, from crystallization of the precipitate. Only tolerably strong solutions are precipitated by the reagent immediately, the limit of the reaction for practical purposes being reached in solutions containing 1:2.000, although weaker solutions, up to 1:3.600, may show a distinct precipitate. This is in strong contrast with the behavior of most of the alkaloids, which are precipitated copiously in solutions containing 1:30.000 to 1:80.000. In the more dilute solutions of morphine the precipitate assumes the form of distinct crystals. In titrating a morphine solution with Mayer's reagent a point is soon reached where the solution gives no precipitate either with Mayer's reagent or with morphine solution. Just before this point, the solution is observed to give with the reagent, after a few seconds, a translucent gelatinous precipitate resembling exactly precipitated alumina (aluminium The filtrate from this precipitate in a few hours yields distinct crystals. Titration of this alkaloid with Mayer's reagent is not to be recommended.

Pilocarpine.— Comment on the results of experiments tabulated above with this alkaloid are superfluous. The precipitate in some respects behaves much like that of atropine, but it has a strong disposition to crystallize. Notwithstanding this fact, the precipitate varies in weight more widely than in the case of any other alkaloid with which I have made experiments, and that in a most capricious manner. Moreover, solutions prepared from fluid extracts, etc., cannot be titrated satisfactorily with this reagent, the precipitate remaining obstinately suspended, passing readily through any paper filter. The results are reported mainly as a warning to others not to attempt the impracticable.

Quebracho alkaloids resemble in their behavior the alkaloids of cinchona bark. Titration with Mayer's reagent can only serve to indicate roughly the comparative value of different preparations. Of course it does not enable us at all to discriminate the several alkaloids present, which differ widely in their therapeutic action.

Strychnine gives us as satisfactory a titration with Mayer's reagent as any alkaloid in the list. Unfortunately it is always associated in the drugs which contain it with other alkaloids whose behavior is not so exemplary. I shall elsewhere speak of the practical use we can make of this alkaloid in estimating excess of Mayer's reagent in the titration of such alkaloids as require large excess.

The general conclusions to which the experiments thus detailed point are:

First. Results of titrations with Mayer's reagent are influenced by various conditions to such a degree that their indications have at best only an approximate value. For practical purposes, however, they may in many cases be all that we can desire, provided the prescribed conditions are closely adhered to.

Second. In dilute solutions the results of titration are always high, not low. Either a stated correction must be made, or a second experiment carried out, in which the solution is brought to a standard strength, say of 1:200 or 1:300.

Third. The influence of alcohol and of iodides (the same is true to a certain extent of chlorides and bromides) is to interfere with the precipitation, and yet the effect may be beneficial rather than otherwise, the end of the reaction being more sharply defined with them than without. This is especially true in the case of a modified reagent containing an excess of potassium iodide. Such a reagent gives better, *i. e.*, more uniform, results with certain alkaloids than the usual solution, but with others, perhaps the majority, has an opposite effect, so that it could have only a limited applicability.

The mode of conducting a titration must have an important influence on the results. Some direct to allow the precipitate to subside after each addition of reagent, and test a drop of the clear fluid with a drop of the reagent. A more common practice, and that which I have adopted in these experiments, is to filter the fluid after each successive addition of reagent, using the same filter, which must be only large enough conveniently to hold the whole of the fluid.

The titration is concluded when the addition to the filtered fluid — having a volume of about 10 c.c.—of two drops of reagent fails to produce a permanent turbidity. In some cases, the reagent, as it enters the fluid, will produce a transient turbidity, and if a larger quantity is added a precipitate will be produced. This formation of the precipitate being obviously conditioned upon the presence of a large excess of reagent, it is proper to ignore it.

No doubt the results of a titration will coincide more nearly with what theory requires if a considerable length of time is allowed to elapse after each addition of reagent, but this manner of conducting the operation robs it of its single advantage—rapidity of execution—and is not to be recommended, since after all there will be considerable and often quite capricious departures from theoretical figures.

The method, however, of carrying out titrations with Mayer's reagent that has been recently recommended by Frank S. Hereth* secures the advantages of the plan just mentioned

^{*}Pharmaceutical Record, July 1, 1886, p. 909.

without extending the time actually consumed in the operation. The method is as follows: Knowing approximately the alkaloidal strength of the solution to be examined, provide half a dozen or more test tubes or vials, and into each measure 10 c.c. of the solution. To the first add a quantity of reagent a little less than that likely to be required, to the second a somewhat larger quantity and so on. Let the test tubes stand at least eight hours, then test a portion of the clear fluid from each with a drop of Mayer's reagent. The first one which fails to react, obviously has received a quantity of reagent a little more than sufficient for the precipitation, and it will not be difficult to judge by the amount of cloudiness produced in it, just what excess of reagent is present. Of course the value of the titration equivalent, where this method is pursued, will have to be determined anew empirically.

One object sought in my experiments was to ascertain approximately the composition of the several precipitates, and their weights as compared with that of the alkaloid they contained. Most of them I found to vary considerably in weight The weight of the precipitate often increases materially if it is allowed to stand some time before collecting. In the record of my experiments I did not note the time which elapsed before collecting the precipitate, not realizing the important influence this might have on the results. In most cases, however, the precipitate was collected and weighed almost immediately after it was formed.

The precipitates were analyzed in the following manner. They were dissolved in alcohol, ammonium sulphide in slight excess added, and the mercuric sulphide collected, dried and weighed. The filtrate was treated with a drop or two of solution of ferric sulphate to precipitate the excess of sulphur, filtered and iodine estimated volumetrically by silver nitrate. In a few instances the silver iodide was collected and weighed, the result coinciding with that obtained by titration except in one or two cases, where the precipitate was light in weight, and probably contained chlorine as well as iodine.

It is expected that the color of the precipitate of mercuric sulphide will be black, when an excess of reagent has been employed to produce it. In all but one of my experiments such was the fact, but in an exceptional case I found that the precipitate remained persistently red—a bright brick red like native cinnabar. Which of the alkaloids it was that gave this anomalous result, I cannot now remember, and I neglected at the time to make a note of it, but there is a suggestion, in the observation, of the possibility of producing vermilion by a hitherto unknown process.

The following table gives the result of experiments made with reference to the composition of the precipitate:

Name of alkaloid.	Weight of Prec. containing 100. alkaloid.1	Average weight of alkaloid in 100. of prec. 2 approx.	Weight of prec. analyzed.	Hg. in prec. analyzed.	Atoms Hg.	I. in prec.analyzed.	Atoms I.	Molecular weight of prec. 3
Aconitine Atropine Berberine Berberine Brucine Cinchonidine Cinchonine Cocaine Colchicine Emetine Gelsemine Hydrastine Hydrastine Hyoscyamine Morphine Pilocarpine Quinine Strychnine	179-188 216-245 200 8 190-214 348-370 324-348 240-270 155-180 240-256 185-200 200-210 222-250 190-204 295-340 316-335 258-274	54·8 54·4 55·0 48·9 28·5 30·0 40·7 40·8 52·4 43·5 48·6	182-5 220 206 852 339 246 159 245 210 228 202 208 208 325 264	27-5 51 25 * 80 60 * 62-5 50 84 44 50 * 46 42 81 64 57	0·78 0·78 0·42 0·59 0·96 0·76 0·58 1·02 0·73 0·66 0·66 0·81 1·04 0·95	55 69 75 8 75 8 75 192 176 5 94 25 ? 105 50 8 78 82 60 127 ? 161	2·85 1·6 2·0 2·38 4·62 2·25 7·4 4·10 1·61 2·28 1·87 1·35 2·08 4·11 2·81	954-1002 624-708 6703 749-843 1072-1140 988-1072 491-571 1190-1270 8163 8343 642-7 3 7 541-5821 614-707 1004-1085 860-918

What I desire to show by these tabulated results is that, making all allowance for such deviations from the norma composition as we may look for in complex compounds formed under such circumstances as those of my experiments, a few only of the precipitates approximate what has been ordinarily represented as their normal composition, and very few coincide with the formulas given by Prof. Mayer.

We may assume from the data here presented that in the case of the cinchona alkaloids, emetine, gelsemine (?) and strychnine, the precipitate contains one atom of mercury for each alkaloidal molecular group. For the cinchona alkaloids

and emetine, the normal formula probably is R" 2HI, Hg2; R There is some uncertainty representing the alkaloidal radical. about the record I have of the single experiment made with gelsemine. If there is not some mistake in the recorded figures, the composition of the precipitate is quite anomalous. general the formulas must be less simple than commonly represented and show a smaller proportion of both mercury and iodine than we should expect, unless we abandon the theory In several instances that the compounds are double iodides. the proportion of iodine is but little more than sufficient to satisfy the demands of the dyad mercury. It is possible that in some of these cases a mixture of chlorine and iodine is present, instead of iodine simply, but I think that it is only in exceptional cases that chlorine enters into the composition of these precipitates.

The question of vital consequence is whether precipitates produced by Mayer's reagent are of so constant a composition as to be available for purposes of quantitative estimations. With a few exceptions, where approximate results only are contemplated I believe they are thus available. When they are to be used in this way, they must be produced by adding at once sufficient reagent to precipitate the alkaloid completely, with a small margin of excess. The precipitate must be allowed to stand several hours before it is collected. It will not bear much washing. Some times it will adhere firmly to the beaker; when this is the case, it may be washed once or twice superficially with water, dried in the beaker and weighed; otherwise it can be best collected on a pair of mutually counterpoised filters, washed with a little water so applied as to wash the filters rather than the precipitate, dried at 100° C, and weighed. It is evident that a precipitate thrown down in a solution heavily loaded with foreign substances, such as that obtained from a fluid extract, cannot be advantageously used in this mode of estimation since the precipitate would carry down mechanically too much foreign matter which we cannot wash out without material loss of the substance of our precipitate. It is therefore advisable in such a case to separate the alkaloid, in a crude form at least, in the first instance, dissolve it in

a little acid, make up to a suitable volume—the solution should not contain more than 1:200 of alkaloid—and precipitate from this prepared solution.

Further experiments are required to ascertain more exactly what, under the conditions here prescribed, will be the average weight of the precipitates produced.

The principal reason why the results of titrations made under varying conditions show such large differences, is that there is always required to complete the precipitation of the alkaloid a notable excess of reagent. The quantity of mercury which combines with the alkaloid, although not constant, in most cases, does not show a great range of variation, particularly when the conditions of the precipitation are similar—even though not identical. Some simple mode of estimating the excess of reagent present at the end of the titration—or, better after several hours has elapsed—is therefore obviously a desideratum, and this is one object I have had in view in my experiments.

Prof. Mayer's plan of titrating the excess with decinormal silver nitrate—apart from other considerations—ignored the circumstance that the reagent contains an excess of iodine over and above what takes part in the reaction, and that it also contains chlorine. Besides, the alkaloids requiring titration are not unfrequently in the form of chlorides. obtain any useful results by Prof. Mayer's mathematical calculation is complicated required, of which the data themselves cannot be assumed, a priori, to Observing that the precipitate produced by silver nitrate in a fluid containing Mayer's reagent was at first bright chrome yellow, while on continued addition of the silver solution the successive portions of precipitate passed from a bright to a pale yellow color, it occurred to me that it might after all be possible to estimate the excess of mercury by this means, assuming that the bright yellow compound is a double iodide containing mercury. It appears, however, that this compound is not formed exclusively at the beginning of the experiment, and the color fades so gradually that no exact conclusions could be drawn from the indications presented, although they serve as a rough measure of the amount of the excess.

Incidentally, I desire to direct attention to the existence of the bright yellow compound in question, which I regret I have not had the time to study. It may be merely mercuric iodide in a peculiar state. We know that this compound by sublimation forms yellow crystals, and that when precipitated in presence of peptone or of certain bile constituents, it is vellow and not scarlet, as usual. I think it more probable that it is a double iodide, but if so, and if it contain silver, it is remarkable that it is not sensitive at all, apparently, to In view of the fact that mercurous iodide, although one of the best mercurials, is an unstable compound, and remembering that the iodides of mercury and of silver are both ranked among the most active of known antiseptics, one is tempted to inquire what may be the properties of this yellow compound, and especially its possibilities as a therapeutic agent.

To return, however, to the main line of my investigation, Finding that strychnine was precipitated more perfectly than almost any other alkaloid, and with less variation under different conditions, I thought it might be practicable to estimate the excess of reagent in a solution by the use of this alkaloid, and the plan is one that proves measurably successful. After finishing the titration in the ordinary way, add to the filtered fluid one, two or three cc. of a solution of strychnine. of a strength corresponding exactly with that of the Mayer's Filter and titrate the excess of strychnine with Mayer's reagent, and by deducting the quantity used of the latter from the amount of strychnine solution added, the required excess is obtained. The practical objection to this procedure is that it requires the operator to provide a standard solution of strychnine, which will take some extra time and labor to prepare, and which will, perhaps, change with time, necessitating frequent re-examination after it is once prepared. For the pharmacist I certainly should not recommend the method, and the professional chemist will find fault with it as lacking in precision.

In my experiments with the pure alkaloids, I estimated excess by a very simple colorimetric method as follows: I diluted 1 cc. of the Mayer's reagent to 100 or 200 cc., with pure water, placed 5 cc. of the dilute fluid in a tube of white glass, added a drop of solution of ammonium sulphide, and then diluted portions of the filtered fluid in which I wished to estimate excess until 5 cc. treated in a similar manner gave a fluid of the same shade of color, a pale, golden brown. Suppose that the whole volume of fluid were, at the close of the titatration 12 cc. A portion of this fluid diluted with $4\frac{1}{4}$ times its volume of water gives a color identical with that of my standard which contains 1-200 of the reagent. Then $12 \times 4\frac{1}{4} \div 200$ gives the excess sought.

It will be seen at once that this plan is applicable only in titrations of colorless, or nearly colorless fluids. I have at present no further suggestions to offer in this direction, but there should be no difficulty in devising some simple plan for making this estimation volumetrically.

The work that I have done is, after all, of a preliminary character. In some of it I have doubtless been anticipated by others, whose results I have not met with. I trust that on the foundation that is afforded by the body of observations to which this is a contribution, there will be ultimately built structures of analytical methods that will be able to withstand all storms of adverse criticism.

October 1, 1886.

Query No. 24.

A Report upon the Measures of Weight and Volume, Absolute and Proportional, to be Recommended for the next Pharmacopæia.

By A. B. Lyons, M. D.

Sweeping changes were made by the convention which authorized the last revision of the United States Pharmacopœia in the method of presenting the formulæ. Previously fluids had been uniformly measured, now they are always to be weighed, except in the case of fluid extracts, which are to be made up to a standard of volume. The familiar weights and measures in every day use by the dispensing pharmacist had been employed in the old formulæ, whereas we are now directed to use "parts," of which we are expected to make out at the end of our operation an even hundred, thousand, or ten thousand, as the case may be.

Relative weights, in other words, are substituted for absolute, except in a few instances where the product is required to have a definite absolute weight, and this is then stated both in the familiar terms of troy weight and in the foreign lingo of the metric system, with the original French orthography.

That these changes were premature has been shown in the comparatively small sale of the Pharmacopoia, which in its present form is looked upon by many as a useless book, and by the circumstance that each of the several commentaries on the Pharmacopoias translates the formulæ into the old, familiar, easily intelligible form. Thus, instead of one authoritative formula, we now have for each preparation half a dozen which exactly coincide only by accident, but which any of them serve, for practical purposes, as sufficiently close approximations to the true standard,

As the time approaches for a new edition of the Pharmacopeeia, it is desirable that the fullest expression be obtained from pharmacists with reference to what course should be pur-

sued in the future. This is a question largely of expediency. The most determined advocate of the metric, or of the English system would not advise a course that would restrict the usefulness of the Pharmacopœia. To me the solution of the present problem seems an obvious one. Let the present formulæ stand as they are, unless a single change, to be presently indicated, be thought necessary, but with the per centage formula give its equivalent in the system of weights and measures which the pharmacist still habitually uses in dispensing. The single exception alluded to is an important one. Shall our formulæ continue to give quantities of liquids by weight? The practice is general in Europe, but has never been adopted by the It will be entirely possible to retain the present formulæ, which bring our Pharmacopœia into relation with the German and French, but to give alternative formulæ in the English method, as our Dispensatories do now.

Leaving aside the question of expediency, let us consider candidly the merits of the question, whether liquids in the formulæ of medicinal preparations should naturally be weighed or In dealing with moderately large quantities of material one method is perhaps as convenient as the other. Where the quantities are very large there is a decided difference in favor of the use of the scales. But the quantities of material generally used in making any of the ordinary preparations of the Pharmacopœia is small, and for small quantities of liquid unless extraordinary precision is required the practical man will choose the graduate. It is true that liquids change their volume materially with changes of temperature, but the change will not after all seriously affect the proportions of material used in any ordinary formula. A difference of one per cent. of the quantity may be regarded as the extreme limit of variation from this The argument that graduated apparatus is often carelessly made is of no weight in the abstract. If we use measures we must do so intelligently, and we are as inexcusable for trusting to an erroneous graduate as to a false balance. should use either without assuring himself of its correctness.

To the chemist it is natural to take everything to the balance. He keeps in mind constantly the relations of molecules which are represented in terms of weight and not (for liquids) of volume. It is otherwise with the pharmacist. He combines remedies with reference to the dose to be administered. Fluids are given practically always by measure—by measures it is true that vary widely, yet still with reference to a definite volume standard. The old formulæ for tinctures were nearly all evidently based on the idea of a teaspoonful dose. The new Pharmacopæia prescribes 5, 10, 15, or 20 per cent of drug, making its ideal mathematical uniformity, without reference to the older and more rational idea. It seems to me that it is the physician and the patient whose convenience is to be consulted in framing the formulæ, not merely that of the compounder.

Does it not stand to reason that the strength of preparations should be adjusted also to a standard of measure?

The cogency of this reasoning was indeed admitted in the case of fluid extracts, which are made up to a volume standard. It seems to me to apply with the same force to tinctures, syrups, etc.

The physician is not at all benefited by the present system of uniformity in the strength of the galvanical preparations. He is told that these contain generally either 5, 10, 15, or 20 per cent of the drug, or its equivalent. Supposing him to have memorized the several lists so that he is sure in any particular case whether the preparation contains 5 or 15 per cent of the drug. After all he does not know how much there is in a teaspoonful, or if he does it is by solving a mathematical problem for which tew will have present in their minds the data. Surely the physician is entitled to the first consideration in this matter. Either give him uniformity, by measure, of dose, or give him a volumetric uniformity of strength so that he can easily compute the dose.

Passing to another branch of the subject: what system of weights and measures is to be recommended for adoption in expressing absolute quantities? Since the question is one of expediency, we may safely say that at present the metric system is not to be thought of. The formulæ as they stand are easily

carried out indeed in metric quantities, merely putting the word "gram" for "part." But there seems to be a difference of opinion about retaining the old English weights and measures. About a year ago Prof. Oldberg published a system which he offered as a substitute for that now in vogue, which retained the familiar names, with slight changes of value, and brought the values practically into relationship with those of the metric system. He proposes to make the grain of his system exactly 1-6 of one gram (=0.0625) a little smaller than our present grain (0.0648); the drachm would be equal to 4 grams or 64 grains; the ounce to 8 drachms (-512 grains)=or 32 grams; the pound to 16 ounces or 512 grams. He would have a corresponding system of measures, the denominations being minim, fluidrachm=(4 fluigrams)-fluidounce, pint, and gallon, but he would not bring these into exact accordance with the measures of the metric system, for his fluigram would be a volume of water which weighed in the air at 23°C, under the average barometric pressure, would weigh sixteen grains. The cubic centimetre it will be remembered corresponds with the gram under different conditions of temperature and pressure.

In the British system of weights and measures a fluidounce of distilled water weighs, at 62° F. under the standard barometric pressure, exactly one ounce avoirdupois. Were a new system to be adopted, bearing relation to one already established, it would be best to adopt the same conditions of correspondence between the weight and volume standards. If we are to have a drachm that corresponds with 4 grams let us by all means have a fluidrachm corresponding with 4 cubic centimeters. Or, if it is more important that we should be able to convert, with tolerable accuracy, weights into volume equivalents, let us at least adopt the basis of comparison established in English usage.

Is it advisable to try to introduce any such new system? Prof. Oldberg urges its adoption on the following grounds:

- 1. It is to be preferred to the metric system because its denominations are already practically familiar, although they will have a slightly modified value.
- 2. Its units are more convenient and natural than those of the metric system.

- 3. Its octenary ratios of increase are much more convenient than the decimal ones of the metric system.
- 4. It is a safer system than the metric, in which values are determined in the notation by the trivial circumstance of the position of a dot.
- 5. As compared with our present system, the new has the great advantage of exact correspondence between the units of weight and those of volume.
- 6. The units of the proposed system are commensurable with those of the metric system, which is soon to be the universally accepted system outside of the United States and the British Empire.

Let us examine these arguments seriatim.

- 1. We may concede the force of the first, provided it be shown that a change, other than the adoption of the metric system, is necessary or advisable.
- 2. Those units seem to us natural and convenient to which we are accustomed. Prof. Oldberg lays especial stress on the circumstance that a minim is easily associated in our minds with a drop (of water). This would, to my mind, be an unfortunate circumstance if it were likely to encourage the practice of measuring anything by drops.

If we have regard to convenience for the dosing of medicines, it seems as though the fluigram must have the preference. A teaspoonful dose may be 50 or it may be 80 minims, but 4 ccm., or 4 fluigrams, is a very definite quantity. The physician may diminish his dose to 3 or increase it to 5, whereas if he reckons by the teaspoonful he can only say vaguely a scant teaspoonful, or a full teaspoonful. Of course he may specify the number of minims, but to one unaccustomed to this mode of measuring the expression 45 minims would convey no idea of the fraction of a "teaspoonful" that was meant. If, however, we habitually measured in ccm. or fluigrams, the difference between 3, 4, and 5 of these units would be at once appreciated, and even if conventionally the teaspoonful were considered to be synonymous with 4 fluigrams, the fractional quantities would be quickly computed.

In expressing the doses of powerful remedies, such as the poisonous alkaloids, we find again that the metric system furnishes us in the milligram and centigram, units much more convenient than any in our system. The decigram is as convenient to those accustomed to its use as the grain, the gram as the drachm and ounce, the kilogram as the pound, the metric ton as the ton of 2,000 or that of 2,400 pounds.

3. The convenience of the octenary system, permitting of repeated halving without fractions is, to my mind, more than counterbalanced by the inconvenience of a system in which the prime divisors, 3 and 5, inevitably produce fractions. Prof. Oldberg deliberately excludes the only three in our system of weights just at the point where it is most needed. Of course when we have adopted a system having any particular prime factors, we shall avoid, whenever we can, attempting to divide by factors not present in our system. The advantage of the octenary system is, however, more than counterbalanced by the circumstance that all our reckoning is by the decimal system; it is almost impossible for us to think in any but the decimal sys-Our notation is decimal, and a system in which there is no necessity for mathematical calculations to translate a quantity expressed in terms of one denomination into those of another, commends itself most strongly to the practical man.

We wonder how the Englishman can go on generation after generation reckoning his accounts in the pounds, shillings, and pence that involve such constant application of the rules of reduction ascending, and reduction descending—of which our American accountant may remain for ever blissfully ignorant. Yet to such labor of never ending computation are we condemned by the adoption of a binary or an octenary system.

4. But if this labor is to act as a safe-guard against mistakes? Do not lay that flattering unction to thy soul. The careless man will sometimes misplace his decimal point; is it likely that in multiplying and dividing and carrying he will be exempt from danger of error? When our present currency was first proposed the same argument was urged against its decimal mode of reckoning. I cannot believe, however, that the Ameri-

can book-keeper is half as liable to make mistakes as the English, and I am very sure that the former will stand a much better chance than the latter of finding his error when made.

That those unaccustomed to the metric system are liable to make mistakes in trying to use it I grant, but this is not the fault of the system. It must, however, be considered in advising its adoption.

- 5. Correspondence between standards of weight and of volume is no doubt a most desirable feature in any system. It exists both in the metric and in the imperial systems. The question is whether this argument is not offset by the introduction of units having the same name as those of the British system, but of a different value and incommensurable with them. If a change must be made, are not the most desirable of the ends sought attained by simply adopting the imperial weights and measures of Great Britain?
- 6. The circumstance that the units of the new system are commensurable with the metric units is again offset by the incommensurability of the new units with those of the imperial or of any other existing system.

Prof. Oldberg advocates the adoption by pharmacists and physicians of his proposed new system, without reference to the rest of the community. To me this seems ill advised. It is bad enough that we have now to translate avoirdupois into troy weight, but to improve our system without reference to the usage of the rest of the community is an insane proposition. In so important a matter we can afford to wait a few years, and then all move forward together. It would be very foolish for America to abandon her present system in favor of another, different both from the British and the metric. If America and England should agree to adopt a common system—bearing some definite relation to the metric, the move would be a good one, and it is in that direction that effort should be made.

Another new system has been proposed within the year in which the half kilo was taken as the starting point. It is easy to elaborate systems. What is wanted is that in any movement looking toward change there be concerted action between

all who are likely to be influenced. Personally I retain my liking for the metric system. It is already in use over a large part of the civilized world. It has all the requisites of a universal system. I am not discouraged by the opposition that it meets in this country, nor even by the recent defection from its advocacy by some who, like Prof. Oldberg himself, were formerly most strenuous in their labors in its behalf. Little can be done, however, to bring it into use unless compulsion is brought to bear in some way. The question is much like that of the adoption of standard time. When the community has had enough of the confusion of maintaining individual standards while the common interest demands the adoption of a single one, the question will settle itself, and the day is not so far distant as many think. Meanwhile we may be content to wait, and harmlessly speculate on possible reforms in quiet.

The practical question what to advise with regard to formulæ of the Pharmacopæia must meanwhile be answered. I hope that the next convention will be able to act in the light of a very full expression of the pharmacists of the United States. The convention will be composed, of course, of representative men, but of men to whom the mode of expression in a formula is a matter of indifference, provided only its meaning is clear. They cannot comprehend how any one can find difficulty in using the formulæ as they stand. After all they are capable of understanding that when required to make a pint or a gallon of such a preparation as the compound tincture of lavender it will require at least eight problems in the rule of three to put the formula in working shape, and if they are to measure the ingredients instead of weighing them there will be about as many more operations required in long division. It is not fair to require the busy pharmacist to make all these calculations; it is not right to give him so good an opportunity to make blunders in his arithmetic. He should have not only the percentage composition of his product, but a working formula. My own choice would be to have the formula so framed that the product would be 1,000 volume parts instead of 1,000 parts by weight. however, the principle of basing all formulæ on parts by weight has been adopted and has brought our Pharmacopæia in a

measure into harmony with those of continental Europe, and at any rate facilitates comparisons with their formulæ, it would be unwise to go back to the principle which we, perhaps unwisely, abandoned. At the same time, I believe, the formulæ should in every case give the volume equivalent for the weights prescribed. Thus, in the formula alluded to, we should have the quantity of oil of lavender stated as 8 parts (8.99 volume parts); of alcohol as 680 parts (829 volume parts), etc. But this is not enough. The absolute quantity of each constituent required to make a given measure—conveniently two pints—of the tincture should also be stated. It is less necessary that absolute values be supplied for a formula to produce a given weight of product, since the computation in this case is extremely simple. One pound is 7,000 grains. If the quantities in the formula be multiplied, therefore, by seven, we have in grains the absolute quantities required for one pound of product.

The formula for compound tincture of lavender, according to the foregoing suggestions, should read in full as follows:

	Parts by Weight.	To make two Pints.
Oil of Lavender, eight parts (-9 volume parts)	. 8.	122 minims
Oil of Rosemary, two parts (-2.23 volume parts).	. 2.	30 minims
Cinnamen in coarse powder, eighteen parts	. 18.	231 grains
Cloves, four parts	. 4.	51 grains
Nutmeg, ten parts	10.	129 grains
Red Saunders in coarse powder, eight parts	. 8.	103 grains
Alcohol, 680 parts (829 volume parts)	. 680.	1 pint 71 3
Water, 270 parts (270 volume parts)	. 270.	73 3
Diluted Alcohol, a sufficient quantity	. q. s.	q. s.
To make 1000 parts (1135 volume parts)	.1000.	Two pints

It is instructive in this connection to examine critically the formulæ given by different authorities as equivalents of that of the United States Pharmacopæia. We shall find differences that are sometimes not inconsiderable. If this is true where the computations are deliberately made by experts, what can we expect when they have to be hastily performed by the busy druggist or his assistant?

As an illustration of the differences we may expect to find among the commentators on the official formulæ turn to the heading "compound tincture of lavender"—an example taken, I may say, wholly at random—in the United States and the National Dispensatories, to go no further. We find the formulæ there given as follows:

τ	Inited States.	National.	Ind't Calculations of the writer.
Oil of Lavender	480 min.	489 min.	488 min.
Oil of Rosemary	120 min.	122 min.	120 min.
Cinnamon	984 grs.	926 grs.	924 grs.
Cloves	219 grs.	206 grs.	20% grs.
Nutmeg	547 grs.	515 grs.	516 grs.
Red Saunders	438 grs.	413 grs.	412 grs.
Alcohol	96 fl. 3	93‡ fl. 3	931 fl. 3
Water	32 fl 💈	30⅓ fl. ₹	30% fl. 3
Volume of product	8 pints	8 pints	8 pints

My own calculation was roughly and hastily made, without thought of placing it in comparision with the others. I have let the figures stand exactly as obtained, to illustrate the practical degree of exactness that is likely to be attained in making such calculations. My results coincide remarkably well with those of the National Dispensatory, but the tincture, if made by the United States Dispensatory, will be about 6 per cent. stronger, as far as the solid ingredients are concerned.

If it is urged that the pharmacist ought to conform to the Pharmacopæia, if all his habits of work must be revolutionized to do it. I reply by conceding the obligation in theory, but submit that since obedience to the Pharmacopæia is to be secured only by moral suasion and tact, it is necessary that reforms, however desirable, be not too suddenly introduced. Let us imitate the wisdom of the conservative Briton in adopting our pharmaceutical code to the capacities and, if you will, to the prejudices of those who are to be governed by it.

DETROIT, Mich., Oct. 6, 1886.

In Memoriam.

WILL L. HYDE, MARSHALL, MICH.

Mr. Will L. Hyde was born May 9th, 1857, at Marshall, Michigan. Having passed with honors the City graded and High schools, he sought additional opportunity for the study of chemistry.

At the age of 18 he entered the drug business, remaining in the store, with the exception of 5 years, when traveling in the Western States for a wholesale drug house, thereafter a very useful, popular clerk.

He was an especial favorite with the young people and respected by the older ones. When the grim relentless messenger called him hence, he with a party of friends were spending a week in camp, in the best of health and spirits, enjoying themselves extremely. Thursday, having worked hard removing from Lyons to Long Lake, Will Hyde tired, retired early in the evening. Friday morning his companions were awaked by his unusual movements. seeming to be in pain. Dr. D. A. Joy, being one of the company, recognized the symptoms as those of epilepsy, and having his case of medicines with him speedily applied the usual restoratives. But the severity of the symptoms increasing, assistance was secured from the adjoining farm houses and a council of physicians from the city. At one time he rallied sufficiently so that all thought he would About noon, however, he had a second attack, and in the midst of it the lamp of life flickered and went out.

The deceased was a son of the Hon. and Mrs. Augustus O. Hyde. The funeral services were attended by a large concourse of sympathizing friends, and his death is another reminder that but a step exists between time and eternity.

ISAAC WATTS, FRANK J. WURZBURG, WM. DUPONT,

Committee.

In Memoriam.

WILLIAM S. ANDREWS, UTICA, MICH.

We, the principal physicians of the place, give a memorial sketch of the deceased as follows:

WILLIAM S. ANDREWS was born at Utica, Michigan, June 6th, 1852. After receiving a liberal English education he entered into the drug business under the tutorage of his father, Dr. Wm. W. Andrews, which vocation he followed until his death, which occurred March 21st, 1886, of congestion of the brain. The business career of Mr. Andrews was noted for the unswerving promptness with which he met his obligations. Although not a graduate of Pharmacy, the close, careful, systematic manner in which he dispensed his drugs, won for him the entire confidence of the physicians with whom he dealt and the esteem of the community in which he lived, who, on several occasions, called upon him to fill offices of public trust. His untimely death was a great loss, not only to his immediate friends, but to the profession in which he was an earnest worker.

P. A. KNIGHT, M. D., GEORGE G. ROBERSON, M. D.

In the death of Mr. Andrews the Association loses an interested worker and one of its charter members, he having joined in 1883.

ISAAC WATTS, FRANK J. WURZBURG, WM. DUPONT,

Committee.

QUERIES,

TO BE REPORTED UPON AT THE FIFTH ANNUAL MEETING OF 'THE MICHIGAN STATE PHARMACEUTICAL ASSO-

CIATION, TO BE HELD IN

PETOSKEY, JULY 12, 13 AND 14, 1887.

- 1. What is the quality of the Terebene of commerce?
- 2. Dr. Weld has recently shown that tinct. of chloride of iron, when diluted with water, acts very energetically on the teeth. In what vehicle can it be prescribed so as to have a minimum of injurious effect?
- 3. Polygonum aviculare—common knot grass—is said to contain a considerable quantity of alkaloid. Has it active medicinal or toxic propperties?
- 4. A quantitative determination of the mineral constituents of the water of Lake Superior is desired. Accepted by W. F. Jackman.
- 5. What advantages has lanolin or again over the ointment bases now in use? Accepted by S. B. Carr.
- 6. A simple method of estimating the quantity of glycerin in fluid extracts, etc., is desired. Accepted by A. J. Baumhardt.
- 7. Is copper present to an injurious extent in medicinal extracts, solid or fluid? Accepted by D. P. Shuler.
- 8. What is the proportion of nitrous ether in the concentrated nitrous ether of the U. S. Pharmacopæia?
- 9. What proportion of quinine does commercial citrate of iron and quinine contain? Accepted by E. C. Federer, Detroit.
- 10. What is the best agent to use for preventing cryptogamic growths in solutions of alkaloids? (Among those proposed are phenol, thymol, camphor, chloroform, carbon bisulphide, boric, salicylic, benzoic, and cinnamic acids).
 - 11. Why is not damiana named among the ingredients of Celerina?
- 12. A report is desired on the value of the new tests (thymol and naphthol) for glucose.
- 13. An examination of the formulas of the several dispensatories, given as equivalents for those of the U. S. Pharmacopæia, is desired. Accepted (in part) by Λ . B. Lyons, Detroit.

- 14. Fowler's solution has been found very variable in strength. Is this due to instability of the preparation? If so can any improvement be made in the formula to secure stability?
- 15. What is the best paste for labeling bottles, and how can paste be best preserved?
 - 16. What is the comparative value of Indian and American cannabis?
- 17. What is the quality of the cinchona bark found in retail drug stores? Accepted by L. A. Ellis.
- 18. What are the most useful simple tests for the wholesomeness of drinking water?
- 19. What practical uses can the druggist make of the microscope, and what is the cost of such an instrument as would serve his purposes? Accepted by Mrs. L. R. Stowell, Ann Arbor.
- 20. Is it admissible to use in a prescription calling for dilute phosphoric acid, a solution of glacial phosphoric acid?
- 21. Could not quinine hydrochlorate be often advantageously substituted for the sulphate?
- 22. Which are the more uniform in strength, preparations made by weight or by measure? Accepted by A. B. Stevens, Ann Arbor.
- 23. Are medicines administered in gelatine suppositories as active as those made with cacao butter?
- 24. What is the best method or apparatus for making small emulsions? Accepted by A. B. Stevens, Ann Arbor.
- 25. Does the present pharmacopæial formula for syrup of the phosphates of iron, quinine, and strychnine yield a satisfactory product? Accepted by C. E. Foote, Jackson.
- 26. What are the best materials and proportions for gelatine suppositories and pencils? Accepted by H. G. Coleman, Kalamazoo.
- 27. In Kerner's volumetric estimation of other Alkaloids, with quinine sulphate, what effect has temperature during titration? Accepted by E. A. Ruddiman, Ann Arbor.
- 28. What articles and mixtures are liable to cause explosions in dispensing pharmacy?
- 29. What strengths of tincture of opium are furnished in pharmacy in this state? Accepted by A. Van Zwaluwenberg:
- 30. What are the causes of the variations in color of tincture of opium? Accepted by J. O. Schlotterbeck.
- 31. Of what strength of morphine is the camphorated tincture of opium dispensed in this state?
- 32. How does the spirit of camphor used in filling physicians' prescriptions compare in strength with present pharmacopæial requirements? Accepted by Geo. McDonald, Kalamazoo.

- 88. By what influences is cocaine liable to be converted into amorphous alkaloids? Is hygrine a definite compound? Accepted by F. G. Novy, Ann Arbor.
- 34. What are the most practicable tests of the purity of linseed oil? Accepted by A. B. Prescott, Ann Arbor.
- 35. What is the best place for the prescription stand? Accepted by A. B. Stevens, Ann Arbor.
- 36. By what method can medicinal phosphoric acid be estimated volumetrically? Accepted by B. W. Cheever, Ann Arbor.
- 37. What disinfectant and antiseptic preparations can the dispensing pharmacist make with advantage? Accepted by A. S. Mitchell.
- 38. There is a wide variation in the price of the seidlitz powders of different manufacturers. An examination of the weight, purity, etc., of the commercial article would be of much interest. Accepted by E. H. Marshall.
- 39. What branches of general education are requisite for those who are to enter upon the practice and study of pharmacy? Accepted by A. B. Prescott, Ann Arbor.
- 40. A report is desired upon some of the recent analytical methods for the estimation and separation of strychnine and brucine when in mixture? Accepted by H. W. Snow, Detroit.
- 41. It is stated that Ignatia beans contain a larger percentage of total alkaloids (strychnine and brucine) than nux vomica, with a relatively higher percentage of strychnine. Confirmation of this is desired. Accepted by H. W. Snow, Detroit.
- 42. A report is desired on the accuracy to be obtained in the estimation of atropine gravimetrically by precipitation with Mayer's reagent.
- 48. Criticisms are desired of the botanical classification adopted by the U. S. Pharmacopæia. Accepted by Dr. A. B. Lyons, Detroit.
- 44. What co-operative measures may the druggists of our state adopt by which their business interests may be advanced?
- 45. Is an apprentice in a drug store entitled to receive instruction in practical pharmacy from his employer, and to what extent is the latter held to grant a reasonable time for daily study? Accepted by O. Eberbach, Ann Arbor.
- 46. A chemical and microscopical examination of lappa (burdock) is desired. Accepted by Miss F. E. Hendershott.
- 47. By what means can oil of tansy be detected in mixtures? Accepted by V. C. Vaughan, Ann Arbor.
- 48. To what extent are mercurial oxides present in mass of mercury? Accepted by O. C. Johnson, Ann Arbor.

CONSTITUTION AND BY-LAWS,

Adopted at Lansing, Michigan, November 15, 1888.

PREAMBLE.

Whereas, Organization, concert of action and comparison of ideas are necessary to the advancement of any cause, and believing that a State Pharmaceutical Association will accomplish these objects, therefore.

Resolved, That we, druggists of the State of Michigan, in convention assembled at Lansing, organize ourselves into such an Association, and adopt the following Constitution and By-Laws:

ARTICLE I.

This Association shall be called the Michigan State Pharmacentical Association.

ARTICLE II.

The objects of this Association shall be to unite the reputable pharmacists and druggists of this State, to improve the science and art of pharmacy, to elevate its standard and ultimately to restrict the practice of pharmacy to properly qualified pharmacists, and to promote by all legitimate means the business interests of its members.

ARTICLE III.

MEMBERSHIP.

Every pharmacist of good moral and professional standing, whether in business on his own account or employed by another, and teachers of pharmacy, materia medica, chemistry and botany, who may be specially interested in pharmacy, shall be eligible to membership.

ARTICLE IV.

OFFICERS.

The officers of this Association shall be a President, three Vice-Presidents, a Secretary, an Assistant Secretary, to be selected from the place of next meeting, a Treasurer and an Executive Committee of five members, all of whom shall be elected at the regular annual meeting of the Association by ballot, and to serve until their successors are elected.

ARTICLE V.

DUTIES OF OFFICERS.

Section 1. The President, or in his absence or inability to serve, the Vice-Presidents in their order, shall preside at all meetings of the Association until the close of such meeting, call special meetings at the written request of twenty-five members, shall present at each meeting a report of the Association and perform such other duties as pertain to the office.

SEC. 2. The Secretary shall keep a record of all the proceedings of the Association. He shall keep a roll of the names of members, with their residence, date of admission, and any subsequent changes. He shall read all communications, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting; at each annual meeting render a report of the duties performed by him since the last annual meeting, and in conjunction with the Executive Committee, shall superintend such publications as the Association shall direct. He shall notify members of their election; also, notify members of committees of their appointment and election, and furnish each member of the committees with the names of their associates on said committees. He shall receive and collect all moneys for dues, and from all other sources, giving receipts for the various amounts, keep a correct account thereof, and pay the same to the Treasurer, taking his receipt He shall give a sufficient bond, subject to the approval of the committee.

- SEC. 3. The Treasurer shall have charge of all the funds of the Association, for which he shall be personally responsible, pay all orders of the Secretary when countersigned by the President, render a full report of his transactions at each annual meeting, and report the state of the treasury, when called upon by the Executive Committee. He shall give a sufficient bond, subject to the approval of the Executive Committee.
- SEC. 4. It shall be the duty of the Secretary and the Treasurer to turn over to their successors, without unnecessary delay, all papers and property of the Association committed to their care.
- SEC. 5. It shall be the duty of the Executive Committee to aid the Local Secretary in making arrangements for the meetings of the Association, to investigate applications for membership, audit all bills against the Association, and attend to all other business not otherwise assigned.

ARTICLE VI.

MEETINGS.

The annual meeting of this Association shall be at such time and place as the Association shall previously determine.

ARTICLE VII.

BY-LAWS.

This Association may establish for its future government and regulation such By-Laws not in conflict with this Constitution as may be deemed proper and desirable.

ARTICLE VIII.

AMENDMENTS.

Every proposition to alter or amend this Constitution shall be submitted in writing and received at an annual meeting, and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.

QUORUM.

Twenty members shall constitute a quorum.

ARTICLE II.

MEMBERSHIP.

The names of persons applying for membership, with their age, residence, present occupation, and length of experience in pharmacy shall be presented to the Association in writing, signed by two members in good standing, and shall be referred to the Executive Committee, and if favorably reported by that committee, the candidate may be balloted for at once. A vote of two-thirds of the members present shall be required for election.

ARTICLE III.

FEES.

The initiation fee of this Association shall be one dollar, which fee shall be paid to the Secretary.

ARTICLE IV.

DUES.

Every member shall pay annually, in advance, into the hands of the Secretary, the sum of one dollar. Any one in arrears at an annual meeting shall not be entitled to vote, and any one neglecting to pay said dues for three successive years, shall forfeit his membership.

ARTICLE V.

CERTIFICATE OF MEMBERSHIP.

Each member of this Association may, if he desires, upon the payment of one dollar, receive a certificate of membership which shall be issued by the Secretary, provided said member is not in arrears for dues,

ARTICLE VI.

COMMITTEES.

SECTION 1. The President shall, before the close of each annual meeting, appoint the following committees, (of which he

shall be an ex-officio member,) each to consist of three members, viz: Committee on Trade Interests, Committee on Pharmacy and Queries, Committee on Legislation.

- SEC. 2. The Committee on Trade Interests shall report at each annual meeting such observations and information upon that subject as may seem to them of interest to the Association.
- SEC. 3. The Committee on Pharmacy and Queries shall report annually respecting scientific progress, discoveries and investigations during the year, and near the close of each annual meeting a proper number of questions of scientific or practical interest, and shall secure the acceptance of as many of such questions for investigation as may be practicable to be reported upon at the next annual meeting.
- SEC. 4. The Committee on Legislation shall keep a record of and compile, for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each annual meeting of the Association, what legislation on the subject has occurred during the year, and submit such recommendations with regard to legislation in this State as shall appear to them proper.

ARTICLE VII.

SUSPENSIONS-AMENDMENTS.

SECTION 1. These By-Laws shall not be suspended without the consent of two-thirds of the members present.

SEC. 2. Any amendment to these by-laws must be made in writing, and read before the Association at one sitting, and laid over to a subsequent sitting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of these by-laws.

ARTICLE VIII.

DELEGATES.

Five delegates and five alternates shall be annually elected to attend the meetings of the American Pharmaceutical Association; also, to attend the National Retail Druggists' Association.

ARTICLE IX.

PROCEEDINGS.

The proceedings of the Association, the roll of officers, committees and members shall be published annually under the supervision of the Secretary and Executive Committee, and a copy of the proceedings sent to each member of the Association.

ARTICLE X.

SUSPENSION OF MEMBERS.

Any member may be expelled for improper conduct or any officer removed from office, for violating the constitution or by-laws, but no person shall be expelled or removed except by a two-thirds vote of all the members present at a regular meeting, and after he shall have been given an opportunity to be heard in his own defense.

ARTICLE XI.

EXHIBITS.

The Association invites manufacturers and others to exhibit at the annual meeting, crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

ARTICLE XII.

RULES OF ORDER-ORDER OF BUSINESS.

Section 1. The Rules of Order of this Association shall be those in common use in deliberative assemblies, and such special rules as may be adopted by the Association.

SEC. 2. The Order of Business shall be as follows:

- 1. Calling roll of members.
- 2. Reading of minutes of previous session.
- 3. Address of retiring President.
- 4. Applications for membership.
- 5. Election of members.
- 6. Reports of officers and committees.
- 7. Miscellaneous business.
- 8. Reading of communications,
- 9. Election of officers.

PHARMACY LAW OF MICHIGAN.

An Act to Regulate the Practice of Pharmacy in the State of Michigan.

Section 1. The People of the State of Michigan enact, That the Governor with the advice and consent of the Senate shall, within thirty days after the passage of this act, appoint five persons, and annually thereafter one person from among such competent pharmacists in the State as have had ten years' practical experience in dispensing physicians' prescriptions, who shall constitute the Michigan Board of Pharmacy. The terms of office of said five persons shall be so arranged that the term of one shall expire on the 31st day of December of each year, and all appointments made thereafter shall be for the term of five years.

Sec. 2. The said board shall within thirty days after its appointment, meet and organize by the election of a president and secretary, from its own members who shall be elected for the term of one year, and shall perform the duties prescribed by the board. It shall be the duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to investigate complaints and to cause the prosecution of all persons violating its provisions; to report annually to the Governor, and to the Michigan Pharmaceutical Association upon the condition of pharmacy in the State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all pharmacists duly registered under this The board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties, at least once in four months, said meetings to be held on the first Tuesdays of March, July and November of each year; shall make by-laws for the proper fulfillment of its duties under this act, and shall

keep a book of registration in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. The records of said board, or a copy of any part thereof, certified by the secretary to be a true copy, attested by the seal of the board, shall be accepted as competent evidence in all courts of the State. Three members of said board shall constitute a quorum.

Sec. 3. The secretary of the board and the treasurer thereof, if such separate office be created, shall receive a salary, which shall be fixed by the board. They shall also receive the amount of their traveling and other expenses incurred in the performance of their official duties. The other members shall receive the sum of three dollars for each day actually engaged in this service, and all legitimate and necessary expenses incurred in the performance of their official duties. Said salaries, per diem and expenses shall be paid from the fees received under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be paid into the State treasury at the end of each year, and so much thereof as shall be necessary to meet the current expenses of said board shall be subject to the order thereof, if in any year the receipts of said board shall not be equal to its The board shall make an annual report and render an account to the Board of State Auditors and to the Michigan Pharmaceutical Association, of all moneys received and disbursed by it pursuant to this act.

SEC. 4. Every person who shall, within three months after this act takes effect, forward to the Board of Pharmacy satisfactory proof, supported by his affidavit, that he was engaged in the business of dispensing pharmacist on his own account in this State at the time this Act takes effect, in the preparation of physicians' prescriptions, or that at such time he had been employed or engaged three years or more as a pharmacist in the compounding of physicians' prescriptions, and was at said time so employed in this State, shall, upon the payment to the board of a fee of two dollars, be granted the cer-

tificate of a registered pharmacist: *Provided*, That in case of failure or neglect to register as herein provided, then such persons shall, in order to be registered, comply with the requirements provided for registration as a licentiate in pharmacy, hereinafter described.

SEC. 5. No person other than a licentiate in Pharmacy shall be entitled to registration as a pharmacist, except as provided in section four. Licentiates in pharmacy shall be such persons, not less than eighteen years of age, who shall have passed a satisfactory examination touching their competency before the board of Pharmacy. Every such person shall, before an examination is granted, furnish satisfactory evidence that he is of temperate habits, and pay to the board a fee of three dollars. Provided, That in case of the failure of any applicant to pass a satisfactory examination, the money shall be held to his credit for a second examination at any time within one year. The said board may grant certificates of registration without further examination to the licentiates of such other boards of pharmacy as it may deem proper upon a payment of a fee of two dollars.

SEC. 6. The said board may grant, under such rules and regulations as it may deem proper, at a fee not exceeding one dollar, the certificate of registered assistant, to clerks or assistants in pharmacy, not less than eighteen years of age, who at the time this act takes effect shall be engaged in such service in this State, and have been employed or engaged two years or more in the practice of pharmacy, but such certificates shall not entitle the holder to engage in such business on his own account, or to take charge of or act as manager of a pharmacy or drug store.

SEC. 7. Every registered pharmacist, or registered assistant, who desires to continue the practice of his profession, shall annually, after the expiration of the first year of his registration, during the time he shall continue in such practice, on such date as the board of pharmacy may determine, pay to the said board a registration fee to be fixed by the board, but which shall not exceed one dollar for a pharmacist, or fifty cents for an assistant, for which he shall receive a renewal of said regis-

tration. Every person receiving a certificate under this act shall keep the same conspicuously exposed in his place of business. Every registered pharmacist, or assistant, shall, within ten days after changing his place of business or employment, as designated by his certificate, notify the secretary of the board of his new place of business. If any pharmacist or registered assistant shall fail or neglect to procure his annual registration, or to comply with the other provisions of this section, his right to act as such pharmacist or assistant shall cease at the expiration of ten days from the time notice of such failure to comply with the provisions of this section shall have been mailed to him by the secretary of said board.

SEC. 8. All or any registration obtained through false representation shall be void, and the board of pharmacy may hear complaints and evidence, and may revoke such certificates as it may deem improperly held.

Sec. 9. Any proprietor of a pharmacy, who, not being a registered pharmacist, shall, ninety days after this act takes effect, fail or neglect to place in charge of such pharmacy a registered pharmacist, or any such proprietor who shall by himself, or any other person, permit the compounding or dispensing of prescriptions, or the vending of drugs, medicines, or poisons, in his store or place of business, except by or in the presence and under the supervision of a registered pharmacist, or except by a registered assistant, or any person not being a registered pharmacist, who shall take charge of or act as manager of such pharmacy or store, or who, not being a registered pharmacist or registered assistant, shall retail, compound, or dispense drugs, medicines, or poison, or any person violating any other provision of this act to which no other penalty is herein attached, shall be deemed guilty of a misdemeanor, and for every such offense, upon conviction thereof, shall be punished by a fine of not less than ten nor more than one hundred dollars, and in default of payment thereof, shall be imprisoned not less than ten days, nor more than ninety days, or both such fine and imprisonment, in the discretion of the court.

Sec. 10. Nothing in this act shall apply to, or in any manner interfere with the business of any practicing physician, who does not keep open shop for the retailing, dispensing, or compounding of medicines and poisons, or prevent him from supplying to his patients such articles as may seem to him proper, nor with the business of any retail dealer engaged in business at a distance of not less than five miles from the limits of any incorporated village or city, except physicians' prescriptions, nor with the vending of patent or proprietary medicines by any retail dealer, nor with the selling, by any person of drugs, medicines, chemicals, essential oils and tinctures which are put up in bottles, boxes, or packages bearing labels securely affixed, which labels shall bear the name of the pharmacist or druggist putting up the same, the dose that may be administered to persons three months, six months, one year, three years, five years, ten years, fifteen years and twenty-one years of age, and if a poison the name or names of the most common antidotes, of copperas, borax, blue vitrol, saltpeter, pepper, sulphur, brimstone, paris green, liquorice, sage, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerin, glauber salts, epsom salts, cream tartar, bi-carbonate of soda, sugar of lead, and such acids as are used in coloring and tanning, nor with the selling of paregoric, essence of peppermint, essence of ginger, essence of cinnamon, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, No. 6, sweet spirits of nitre, laudanum, quinine, and all other preparations of cinchona bark, tincture of aconite and tincture of iron, compound cathartic pills, or quinine pills, when such cathartic or quinine pills are compounded by and put up in bottles or boxes bearing the label of a registered pharmacist, with the name of articles and directions for its use on each bottle or box, nor with the exclusively wholesale business of any dealer.

Sec. 11. No person shall add to or remove from any drug, medicine, chemical or pharmaceutical preparation, any ingredient or material for the purpose of adulteration or substitution, which shall deteriorate the quality, commercial value or medicinal effect, or which shall alter the nature or composition of

such drug, medicine, chemical or pharmaceutical preparation, so that it will not correspond to the recognized tests of identity Any person who shall thus wilfully adulterate or alter, or cause to be adulterated or altered, or shall sell, or offer for sale, any such drug, medicine, chemical or pharmaceutical preparation, or any person who shall substitute, or cause to be substituted, one material for another, with the intention to defraud or deceive the purchaser, shall be guilty of a misdemeanor, and be liable to prosecution under this act. victed he shall be liable to all the costs of the action, and for the first offense be liable to a fine of not less than ten dollars nor more than one hundred dollars, and for each subsequent offense, a fine of not less than twenty-five dollars nor more than one hundred and fifty dollars. On complaint being entered, the board of pharmacy is hereby empowered to employ an analyst or chemist, whose duty it shall be to examine into the so-called adulterations, substitutions, or alteration, and report upon the result of his investigation; and if said report shall be deemed to justify such action the board shall duly cause the prosecution of the offender, as provided in this act.

SEC. 12. The senior pharmacist of every house dispensing and compounding medicines registered under this act shall be exempt and free from all jury duty in the courts of this State.

Sec. 13. All acts and parts of acts in conflict with the provision of this act are hereby repealed.

Approved June 2d, 1885.

ROLL OF MEMBERS.

Members are requested to notify the Secretary of any change in address, death of members in their locality, or errors in the roll.

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	.Otsego
Adamson, J. W	$.\mathbf{Holly}.\dots\dots1885$
Ahlborn, Augustus	.Detroit
Akey, J. V	. Colon
	.Grand Rapids1884
Allen, A. W	. Detroit, $410~\mathrm{G'd}$ River Ave 1883
Allen, E. F	.Boyne City
Alsdorf, F. M	Lansing
Amberg, Isaac	$. Battle\ Creek $
Anderson, Ellery	.Midland1884
Anderson, Maxon	. Midland
Andrews, S. N	.Flint1884
Andrus, C. S	Detroit, 1151 Jefferson Ave1885
Andrus, E. J	. Utica
Arbour, Henry	. Muir
Arbour, M. T	Orangeville Mills1884
Arnold, W. C	. Ludington
Atwater, C. H	. Lapeer
Baar, Henry	.Grand Haven1885
	.Corunna
	.Stanton
Bahel, C. W	.Otsego Lake1884
	. Detroit, 326 Gratiot Ave1883
	.Elk Rapids1885
	. Plainwell
	Grand Rapids1885
	. Whitehall
	.Ludington
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Bangs, W. Z Holland	1885
Banks, A. WDetroit, Fort Street west	
Bannard, H. F Kalkaska	
Barbour, F. S Clifford	
Barbour, W. G Linden	
Barbarin, G. F Freeland	
Barker, W. J	
Barrows, J. F Lawrence	
Bartram, E. W	
Bassett, A Detroit	
Bassett, E. C. South Lyon.	
Bassett, J. A Detroit (J. E. Davis & Co.).	
Bauer, A. CGrand Rapids	
Baxter, T. H	
Beach, L T	
Beachum, C. B Romeo	
Beaman, G. W East Jordan	
Beebe, Hosmer Eaton Rapids	
Belsher, W. ESaginaw	
Bence, G. W	
Bennett, J. R	
Bennett, L. T. EPort Huron	
Bertram, JuliusAlpena	
Bertram, J. P Westphalia	
Bessac, H. B Milan	
Bigelow, C. PBig Rapids	
Bigelow, W. H Owosso	
Bigg, A. H Detroit, 225 St. Aubin Ave.	
Bird, C. E Saugatuck	
Bird, Jr., HenryDouglas	
Birge, W. E Kalamazoo	
Bisbee, A. B Benton Harbor	
Blacklay, T. LJones	
Blackmer, H. A	
Blair, C. A Morenci	. 1885
Blakeslee, L. G Detroit, 177 Griswold St	
Blakeslee, N. P	.1886
Blocher, CharlesMillington	. 1885

Boehnlein, GeorgeDet	
Bolio, Oliver Det	troit, Michigan Ave1884
Bond, E. C	skegon1885
Botsford, E. SDo	rr1886
Bower, ManleyCla	rkston1883
Braddock, O. L Sou	1th Bay City
Bridgeman, M. L Me	nominee
Briggs, J. WSch	
Bristol, F. E La	peer
Bristol, U. DLa	
Brooks, Charles East	st Saginaw1884
Brown, D. D Kal	lamazoo1885
Brown, H. J An	
Brown, I. V	lesburg
Brown, J. JOko	emos
Browning, G. B De	eatur1885
Brundage, FredMu	
Bruske, REas	
Buchanan, B. F	
Buchanan, S. C Har	
Bugbee, C. A Che	
Bullard, E. AVas	
Bullock, S. V Hov	
Burdick, H. H Bay	•
Burroughs, C. SClin	
Burwell, R. G For	t Gratiot
Cady, G. F	
Caldwell, G. G Bat	
Caldwell, J. WDet	
Calkins, H. W	
Calkins, S. B Pet	
Cameron, Alexander	
Carman, N. F	
Carney, M. S Dec	
Carpenter, A. D	
Carpenter, A. D	псетона1885

Carrier, HubertBay City	1884
Carroll, M. ALudington	
Carroll, WatsonLudington	
Chamberlain, G. T Hartford	1883
Chamberlain, M	
Champney, A. R Detroit, 709 V	
Chandler, C. A Cambria Mills	
Chapple, L. D	
Church, H. M	
Clark, A. G	1883
Clark, J. KBlissfield	
Clark, Louis K Elsie	1884
Clark, S. UGrand Rapids	s1885
Clark, W. O Middleville	
Clarke, J. F Climax	1884
Clarke, W. G Detroit, 288 B	aker St1885
Claxton, W. C Detroit, 27 Ch	
Cleland, Henry Detroit, 133 V	
Cleveland, H. WNunica	
Coe, T. D Romeo	
Coffin, C. L Detroit, 1087	
Cole, Levi WPetoskey	
Cole, W. W Morenci	1885
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Coleman, G. E Detroit, Chas.	
	Wright & Co 1885
Coleman, G. E Detroit, Chas.	Wright & Co. 1885 1884
Coleman, G. E Detroit, Chas. Coleman, H. G	Wright & Co. 1885 1884 1886
Coleman, G. E.Detroit, Chas.Coleman, H. G.Kalamazoo.Colwell, C. B.Jackson	Wright & Co. 1885
Coleman, G. E Detroit, Chas. Coleman, H. G	Wright & Co. 1885
Coleman, G. E. Detroit, Chas. Coleman, H. G. Kalamazoo. Colwell, C. B. Jackson Coman, L. S. Bay City Conley, E. V. Stephenson	Wright & Co. 1885
Coleman, G. E. Detroit, Chas. Coleman, H. G. Kalamazoo. Colwell, C. B. Jackson Coman, L. S. Bay City Conley, E. V. Stephenson. Connine, Dewitt. Wexford Connell, F. G. L. Detroit, 166 W. Conrad, J. F. Otsego.	Wright & Co. 1885
Coleman, G. E. Detroit, Chas. Coleman, H. G. Kalamazoo. Colwell, C. B. Jackson. Coman, L. S. Bay City Conley, E. V. Stephenson Connine, Dewitt. Wexford Connell, F. G. L. Detroit, 166 W	Wright & Co. 1885
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Crane, Geo. W
Crawford, J. B
Crispe, John
Crookston, J. A
Cross, F. E
Crouter, G. W
Crowley, J. J Detroit, 425 Michigan Ave 1884
Culver, R. W
Curran, E. S
Currie, A. A
Curtis, C. A
Curtis, F. E
Cutler, W. R
Cushman, H. D
Cummer, R. J
Dahm, A. C
Damon, J. A
Davie, R. P
Davis, F. S
Davis, G. LLansing
Davis, James EDetroit1884
Deitz, G. A
DeBoe, JohnGrand Rapids1884
Demerest, W. M
Dewey, C. C
Dickinson, O. BGrand Rapids1884
Dimick, S. H
Dodd, I. LeRoy HBuchanan1883
Dodds, J. J
Dodds, W. H
Dodge, E. L
Dorrance, A. A
Douglass, F. MBancroft
Dunbar, R. H
Dunham, E. WGrand Rapids1886
Dunlap, ThomasSouth Lyon1884

Dunlop, J. W	Clare
	.Burr Oak
Dunning, N. A	. Mason
	.Detroit, 182 Mich. Ave1883
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Eberbach, O	.Ann Arbor
	. Muskegon
•	. Chesaning
	. Pontiac
	South Bay City1884
	.Bay City
•	. Rogers City
	.Grand Rapids1884
	. Grand Rapids
Everhart, James	. Grand Ledge
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Fairchild, H. B	Grand Rapids1886
	. Howard City
	. Metamora
Farnham, E	. Casnovia
	. Detroit
	.St. Johns
	.Almont1885
	Detroit, F. W. & Co 1886
	.Wyandotte
Feldman, Henry	Sault Ste. Marie1885
Fellows, C. A	.Big Rapids1884
Fenton. A. W	.Bailey
	.Kingsley1885
Fildue, A. S	.St. Johns
Fincher, F. W	Pentwater
Fink, Leon C	.Detroit, Parke, Davis & Co1884
	Mancelona1885
Foote, C. E	. Jackson
	East Saginaw
	.Elmira
Fordham, W. W	Traverse City

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Forrest, G. W
Foster, A. R
Foster, W
Fournier, LucienBay City
Fox, J. R
Francis, J. L
Frank, H. A Detroit, 291 Congress St 1883
Fritz, T. H
Frizelle, C. LDetroit, Mich. Ave1884
Frizelle, S. FDetroit, Mich. Ave1884
Fulton, RobertDetroit, 375 Baker St1884
Fuqua, C. BDetroit, 269 Jefferson Ave1884
Gahan, D. J
Gallinger, E. L
Gardner, A. R Fowlerville
Gates, E. M
Gates, T. O
Geary, S. M
Gebhard, A. E
Gerow, J. E
Gibbs, N. C
Gill, W. J
Gladding, B. O Constantine
Glazier, F. P
Gleason, E. G
Goldsmith, G. S
Goodrich, L. CKalkaska
Goodrich, L. A
Goodsill, A. A Jasper
Goodyear, J. J
Goodyear, W. H
Gorsuch, C. H
Gover, G. HLeaton
Grandy, FrancisFairfield
Graydon, G. HDetroit, J. J. Dodds & Co 1885
Greene, A. L

Gregory, A. W. C. Albion 1884 Griffith, W. H. Howell 1883 Grommon, P. D. — 1885 Grosse, W. F. Sault Ste. Marie 1885 Grunow, O. H. Detroit, 81 Woodward Ave. 1884 Gundrum, George Ionia 1883
Haan, G. T.
Haenssler, G. J
Hagerman, F Birmingham
Haight, A. L
Hale, H. G.
Hall, J. W
Hall, W. A. Greenville
Halladay, O. A Hoylsville
Haller, J. P Sault Ste. Marie
Hallock, D. GDetroit, 760 Fort st. west1884
Halsey, L. J
Hamilton, E. A
Hamilton, C. WSt. Charles
Hamilton, H. GEast Saginaw1884
Hamlen, R. JDetroit, Fort and 7th Sts1885
Hanlon, Amos Middleville
Happy, Charles
Harper, J. C
Harris, D. S
Harrison, B. DBarron, Wis1885
Harrison, D. A
Harrison, H. ERichmond
Harshaw, W. D
Hartz, H. T Detroit, 81 Woodward Ave. 1884
Hastings, R. ASparta
Harvey, E. C. T
Harvey, H. D
Harvey, S. K Detroit, T. H. H. & Sons 1884

Harvey, T	.Farmers
Harwood, G. M	.Petoskey
Harwood, Henry	.Ishpeming
Hawkins, Henry	. Detroit, Hastings St 1883
	.Detroit, 835 Jefferson Ave1886
Hazeltine, A. F	. Grand Rapids
Heath, Fred	.Hastings
Hedges, H. C	. North Lansing
Heimbach, S. J	. Constantine
	. Stanton
Herley, M. L	East Saginaw
	.Belleville
	.Belleville
Hessler, Will	. Rockford
	Milford1884
Hewett, L. E	.Lansing
	.Ludington
	.Evart
Hicks, W. H	Morley
Hicks, W. L	.St. Johns
Higgins, D. W	.Scottville
Hinchman, C. C	Detroit1885
Hinds, E. J	.Midland1886
Hipkins, E. S	.Blanchard
Hitchcock, W. A	. Manistee
Hogeboom, J. G	.Saginaw1884
Hogguer, F. F. W	.Detroit, 20 Monroe Ave1884
Hogle, J. L	. Farmington
Holt, A. E	.Detroit
Hopkins, I. F	.Muskegon 1884
Horner, D. A	.Caro
	. Hastings 1884
Houp, Frank	. Detroit, Michigan Ave 1884
Howard, Charles	.Alpena
	St. Joseph
	.Mendon1885
	. Northville
Hullinger, James	.Big Rapids1883

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Hutton, R. JDetro	
Humphrey, C. EJacks	on1883
Hungerford, C. BNorth	nville
Hunt, A. OSt. Jo	ohns1885
Hunt, F. JDetro	oit1886
Hunter, J. EGrand	d Rapids1884
Hutchings, WmLeslie	
Hutty, F. AGran	
Hurd, A. EDavis	
Hurd, C. W	on Station
Hurd, J. EDetro	oit, 99 Woodward Ave1884
Hyde, A. O Marsl	nall
Hyde, H. JMarsl	nall
Hynes, Quincy	ngs1885
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Inglis, FrankDetro	
Ingram, E. JIron	Mountain1883
Jamison T A South	Roardman 1888
Jamison, T. A South	
Jefts, WillardBig I	Rapids1884
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Kellogg, David	.Lyons1885
Kellogg, J. H	East Saginaw
	.East Saginaw1885
	Au Sable1884
Kelsey, F. E	Ionia
Kemink, Theo	.Grand Rapids1884
Kennedy, T. B	.Commerce1886
Kennedy, E. J	. Detroit, 709 Woodward Ave 1884
	.Hillsdale
Kenyon, W. W	. Howell
	.Berrien Springs1883
Kephart, W	.Berrien Springs1884
	.Custer
	. Benton Harbor
	.Crystall Falls1884
	.Grand Rapids1886
	.Grand Rapids1886
	Tekonsha
	Detroit, 274 Woodward Ave1886
	.Grand Rapids1884
	.Ishpeming1884
	. Negaunee
	. Lakeview
	.Dexter
	.Lisbon
	. Detroit
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	. Sault Ste. Marie
Lane, I. D	. Sand Beach
	. West Bay City1885
	Detroit (J. J. Dodds & Co.). 1884
	. Lakeview
	. Lakeview
	. Ludington
	.Jackson
	.Owosso
	.Owosso
•	. Williamston

Lee, A. BDetroit, 455 Gr'd River Ave1884
Lee, E. DLudington1885
Lee, John
Le Fevre, G. L
Leland, N. P
Lentz, TheodoreDetroit, G'd River Ave1885
Leonard, H
Leuschner, Richard Detroit, 148 Randolph St 1884
Lever, Henry Newaygo
Litchfield, E. C
Little, A. FSpencer Creek1885
Lobdell, J. H
Locher, H. EGrand Rapids1885
Long, B. W
Long, G. L Detroit, Michigan Ave 1885
Longwell, E. B
Longwell, H. D Paw Paw
Lonsbury, J. H
Lonsbury, P. M Reed City
Look, J. QLowell
Luce, Jr., W. O
Lumbard, W. D
Lunn, G. DVestaburg1885
Lusk, Geo. L
Lyman, A. H
Lyons, A. B
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MacKimmie, J. A Detroit, 723 Fort St. west1884
Madill, Thomas Detroit, J. E. D. & Co 1884
Mahon, F. M Oscoda
Mann, Albert Ann Arbor
Mandigo, DellaSherwood1886
Mandigo, W. R Sherwood 1884
Mason, C. A Flint
Mason, G. B
Marr, T. WDetroit, 333 Woodward Avc 1885
Martin, A. F Imlay City

Martin, C. L	
Martin, HenryJackson	Ļ
Martin, Susie APierson1885	,
Martyn, W. J	
Mayer, F. W Sebawaing 1884	Ļ
Maynard, T. CGagetown1884	
Maxson, M. M	j
McCoy, W. BIronwood1885	j
McCrea, H. F Detroit, Woodward Ave1885	,
McDonald, DavidKalamazoo1884	Ļ
McDonald, D. TCalumet1883	
McDonald, George Kalamazoo1883	ţ
McDonald, MurdoSt. Johns1885	
McEvoy, J. E	
McFarland, A Detroit, 506 Michigan Ave1883	
McFarland, Wm Detroit, 506 Michigan Ave 1884	
McInnes, M. V Lapeer 1885	
McHenry, G. A Chippewa Lake1886	;
McKenna, J. DSalt River1884	
McLean, C. EJackson1885	
McMullen, G. HIonia 1883	
McNeal, ByronByron Center1886	
McQueen, E. F Detroit, Brush & Columbia. 1884	
Mead, H. L Escanaba	
Mead, J. N Escanaba	
Merrell, F. P1883	
Merrell, M. CWebberville1883	
Merriam, C. KCuster1883	
Meseroll, D. CJackson	
Mesick, H. J	
Meyers, John	
Meyers, J. KMuskegon	,
Middleton, V. HGrand Rapids1884	
Miles, J. BDexter1884	
Miller, C. N	
Miller, H. J Fort Gratiot1885	j
Miller, N Fremont	į
Millikin, T. J	

Millington, F. S. Kerwin, Kan 1883 Mills, L. M. Grand Rapids 1886 Mills, L. M. Grand Rapids 1886 Millspaugh, G. D. Albion 1883 Moore, John Ann Arbor 1884 Moore, W. B. East Saginaw 1884 Moorland, Charles Hadley 1885 Morford, A. D. Ypsilanti 1884 Morrison, A. W. Constantine 1885 Morrison, Thomas Wayne 1885 Mottram, J. H. H. Detroit, J. E. D. & Co 1883 Mueller, J. C. Detroit, 120 Woodward Ave 1883 Muir, J. D. Grand Rapids 1886 Mulloy, Wm. Minden 1884 Murphy, J. W. Battle Creek 1883 Myers, A. W. Gobleville 1884 Newell, C. P. Richmond 1884 Newman, E. P. Lansing 1885 Noble, M. L. Sparta 1885 North, S. J. Grand Rapids 1885 Northup, B. D. North Lansing 1884 Norres, J. L.
Milner, C. H. Big Rapids 1886 Millspaugh, G. D. Albion 1883 Moore, John Ann Arbor 1884 Moore, W. B. East Saginaw 1884 Moorland, Charles Hadley 1885 Morford, A. D. Ypsilanti 1884 Morrison, A. W. Constantine 1885 Morrison, Thomas Wayne 1885 Motrison, Thomas Wayne 1885 Mutrison, J. H. Detroit, J. E. D. & Co 1883 Mueller, J. C. Detroit, J. E. D. & Co 1883 Mulloy, J. W. Grand Rapids 1886 Mulloy, Wm. Minden 1884 Murphy, J. W. Battle Creek 1883 Myers, A. W. Gobleville 1884 Nelson, E. H. Detroit, F. Stearns & Co 1884 Newell, C. P. Richmond 1884 Newman, E. P. Lansing 1885 Noble, M. L. Sparta 1885 Norl, Gideon Palo 1884 Norris, J. L. Casnovia 1886 Nowell, W. S.
Millspaugh, G. D. Albion. 1883 Moore, John. Ann Arbor. 1884 Moore, W. B. East Saginaw 1884 Moorland, Charles. Hadley. 1885 Morford, A. D. Ypsilanti 1884 Morrison, A. W. Constantine 1885 Morrison, Thomas. Wayne 1885 Mottram, J. H. Detroit, J. E. D. & Co. 1883 Mueller, J. C. Detroit, 120 Woodward Ave. 1883 Mueller, J. C. Detroit, 120 Woodward Ave. 1883 Mulloy, Wm. Minden. 1884 Mulloy, Wm. Minden. 1884 Murphy, J. W. Battle Creek. 1883 Myers, A. W. Gobleville 1884 Neel, H. C. Detroit, 148 Third St. 1884 Newll, C. P. Richmond. 1884 Newll, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Notl, Gideon. Palo. 1885 North, S. J. Grand Rapids. 1885 Northy, B. D. North Lansing. 1883
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Moorland, Charles. Hadley. 1885 Morford, A. D. Ypsilanti. 1884 Morrison, A. W. Constantine. 1885 Morrison, Thomas. Wayne 1885 Mottram, J. H. H. Detroit, J. E. D. & Co. 1883 Mueller, J. C. Detroit, 120 Woodward Ave. 1883 Muir, J. D. Grand Rapids 1886 Mulloy, Wm. Minden. 1884 Murphy, J. W. Battle Creek. 1883 Myers, A. W. Gobleville 1884 Nelson, E. H. Detroit, 148 Third St. 1884 Newell, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Noble, M. L. Sparta. 1885 Noel, Gideon Palo 1884 North, S. J. Grand Rapids 1885 Northup, B. D. North Lansing. 1883 Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg 1884 Noyes, K. W. Paw Paw 1886 Nurney, James. Au Sable. 1884 O'Bri
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Morrison, A. W Constantine 1885 Morrison, Thomas Wayne 1885 Mottram, J. H. H. Detroit, J. E. D. & Co. 1883 Mueller, J. C. Detroit, 120 Woodward Ave. 1883 Muir, J. D. Grand Rapids 1886 Mulloy, Wm. Minden. 1884 Murphy, J. W Battle Creek. 1883 Myers, A. W Gobleville 1884 Newff, H. C. Detroit, 148 Third St. 1884 Newell, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Noble, M. L. Sparta. 1885 Noel, Gideon. Palo 1884 North, S. J. Grand Rapids. 1885 Northup, B. D. North Lansing. 1883 Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manis
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Muir, J. D. Grand Rapids 1886 Mulloy, Wm. Minden. 1894 Murphy, J. W. Battle Creek. 1883 Myers, A. W. Gobleville 1884 Neff, H. C. Detroit, 148 Third St. 1884 Nelson, E. H. Detroit, F. Stearns & Co. 1884 Newell, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Noel, Gideon. Palo. 1884 North, S. J. Grand Rapids. 1885 Northrup, B. D. North Lansing. 1883 Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw. 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manistique. 1886
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Murphy, J. W Battle Creek 1883 Myers, A. W Gobleville 1884 Neff, H. C Detroit, 148 Third St 1884 Nelson, E. H Detroit, F. Stearns & Co 1884 Newell, C. P Richmond 1884 Newman, E. P Lansing 1885 Noble, M. L Sparta 1885 Noel, Gideon Palo 1884 North, S. J Grand Rapids 1885 Northrup, B. D North Lansing 1883 Norris, J. L Casnovia 1886 Nowell, W. S Laingsburg 1884 Noyes, K. W Paw Paw 1886 Nurney, James Au Sable 1884 O'Brien, J. R Detroit 1885 Orr, J. J Tecumseh 1884 Orr, E. N Manistique 1886
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Neff, H. C. Detroit, 148 Third St. 1884 Nelson, E. H. Detroit, F. Stearns & Co. 1884 Newell, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Noble, M. L. Sparta. 1885 Noel, Gideon. Palo. 1884 North, S. J. Grand Rapids. 1885 Northrup, B. D. North Lansing. 1883 Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw. 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manistique. 1886
Nelson, E. H. Detroit, F. Stearns & Co 1884 Newell, C. P. Richmond 1884 Newman, E. P. Lansing 1885 Noble, M. L. Sparta 1885 Noel, Gideon Palo 1884 North, S. J. Grand Rapids 1885 Northrup, B. D North Lansing 1883 Norris, J. L. Casnovia 1886 Nowell, W. S Laingsburg 1884 Noyes, K. W Paw Paw 1886 Nurney, James Au Sable 1884 O'Brien, J. R Detroit 1885 Orr, J. J Tecumseh 1884 Orr, E. N Manistique 1886
Nelson, E. H. Detroit, F. Stearns & Co 1884 Newell, C. P. Richmond 1884 Newman, E. P. Lansing 1885 Noble, M. L. Sparta 1885 Noel, Gideon Palo 1884 North, S. J. Grand Rapids 1885 Northrup, B. D North Lansing 1883 Norris, J. L. Casnovia 1886 Nowell, W. S Laingsburg 1884 Noyes, K. W Paw Paw 1886 Nurney, James Au Sable 1884 O'Brien, J. R Detroit 1885 Orr, J. J Tecumseh 1884 Orr, E. N Manistique 1886
Nelson, E. H. Detroit, F. Stearns & Co 1884 Newell, C. P. Richmond 1884 Newman, E. P. Lansing 1885 Noble, M. L. Sparta 1885 Noel, Gideon Palo 1884 North, S. J. Grand Rapids 1885 Northrup, B. D North Lansing 1883 Norris, J. L. Casnovia 1886 Nowell, W. S Laingsburg 1884 Noyes, K. W Paw Paw 1886 Nurney, James Au Sable 1884 O'Brien, J. R Detroit 1885 Orr, J. J Tecumseh 1884 Orr, E. N Manistique 1886
Newell, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Noble, M. L. Sparta. 1885 Noel, Gideon. Palo. 1884 North, S. J. Grand Rapids. 1885 Northrup, B. D. North Lansing. 1883 Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw. 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manistique. 1886
Newell, C. P. Richmond. 1884 Newman, E. P. Lansing. 1885 Noble, M. L. Sparta. 1885 Noel, Gideon. Palo. 1884 North, S. J. Grand Rapids. 1885 Northrup, B. D. North Lansing. 1883 Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw. 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manistique. 1886
Noble, M. L. Sparta. 1885 Noel, Gideon. Palo .1884 North, S. J. Grand Rapids. .1885 Northrup, B. D. North Lansing. .1883 Norris, J. L. Casnovia. .1886 Nowell, W. S. Laingsburg. .1884 Noyes, K. W. Paw Paw. .1886 Nurney, James. Au Sable. .1884 O'Brien, J. R. Detroit. .1885 Orr, J. J. Tecumseh. .1884 Orr, E. N. Manistique. .1886
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North, S. J. Grand Rapids 1885 Northrup, B. D. North Lansing 1883 Norris, J. L. Casnovia 1886 Nowell, W. S. Laingsburg 1884 Noyes, K. W. Paw Paw 1886 Nurney, James Au Sable 1884 O'Brien, J. R. Detroit 1885 Orr, J. J. Tecumseh 1884 Orr, E. N Manistique 1886
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Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw. 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manistique. 1886
Norris, J. L. Casnovia. 1886 Nowell, W. S. Laingsburg. 1884 Noyes, K. W. Paw Paw. 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N. Manistique. 1886
Nowell, W. S. Laingsburg 1884 Noyes, K. W. Paw Paw 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N Manistique. 1886
Noyes, K. W. Paw Paw 1886 Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N Manistique. 1886
Nurney, James. Au Sable. 1884 O'Brien, J. R. Detroit. 1885 Orr, J. J. Tecumseh. 1884 Orr, E. N Manistique. 1886
O'Brien, J. R. Detroit 1885 Orr, J. J. Tecumseh 1884 Orr, E. N Manistique 1886
Orr, J. J. Tecumseh. 1884 Orr, E. N Manistique. 1886
Orr, J. J. Tecumseh. 1884 Orr, E. N Manistique. 1886
Orr, E. N
Orth L. P Traverse City
Osborn, C. A
Osborne, W. EGrand Rapids1885
Owen, W. H Maple Rapids1886

TO 71 WW A	D + TI 1
Padley, W. A	Benton Harbor1885
	. Sparta
	. Balch, Lenawee Co1886
	. Detroit
	. Port Huron
	. Howell
	.Owosso1883
	.Owosso1883
	. Mason
	.Traverse City
	.Ludington
	. Greenville
	. Detroit, 81 Woodward Ave 1885
	.Corunna1884
	. Detroit, Michigan & Scotten. 1885
	.Walton1883
	. Grand Rapids1885
	.Freeport1885
	. Morenci
	. Burnipps Corners1886
	.West Bay City1883
	. Detroit, 709 Woodward Ave. 1883
	.Kalamazoo
	.Flint
	.Armada
	.Ogden1884
	. Battle Creek
	.Morley1886
	.Bancroft1884
	. Plymouth
	. Detroit, 26 Miami Ave1884
	.Grand Rapids1885
Platts, Randolph	.Port Sanilac1884
	. Detroit1884
Power, J. O	.Addison1884
Prall, D. E	.East Saginaw1883
Pratt, G. O	.Detroit, 41 Marion St1884
Pratt, Stephen	.Howell1885
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Prescott, A. B. Ann Arbor 1883 Preston, George Escanaba 1885 Preston, T. W. Millbrook 1886 Price, O. J. Detroit, 485 14th Ave 1983 Prittie, W. H. Detroit 1885 Purdy, H. D. Fennville 1884 Purvis, G. A. Detroit, 983 Jefferson Ave 1885
Quick, J. B
Raider, J. F. A. Newaygo 1883 Randolph, A. F. Northville 1883 Ray, G. C. West Bay City (Banks) 1885 Reasner, F. M. Jackson 1884 Reck, J. A. North Lansing 1884 Reed, H. T. White Cloud 1885 Reed, S. M. White Cloud 1885 Reidy, Mike Corunna 1884 Reynolds, W. B. Eaton Rapids 1883 Rich, J. W. Manistee 1885 Richards, F. P. Detroit, 780 Jefferson Ave 1885 Richards, T. H. Detroit, 780 Jefferson Ave 1884 Richardson, George Ithaca 1885 Ringler, Eugene Saginaw 1884 Ripley, L. G. Montague 1884 Robbins, J. J. Hubbardston 1883 Robertson, B. J. Breedsville 1884 Robson, W. L. Williamston 1883 Roche, W. J. Lake City 1884 Rodenbaugh, I. N. Mancelona 1885 Rodenbaugh, O. L. Mancelona 1885
Rogers, L. S. Fort Huron. 1884 Rogers, LeRoy. Eastport, Antrim Co. 1886 Ronnefeld, Theo. Detroit, 193 Gratiot Ave. 1883 Rose, W. H. Grand Rapids. 1885 Ross, E. W. Detroit. 1883 Roussin, V. Ludington. 1884 Row, Frank. Lansing. 1884

	Scottville
	.Ann Arbor1884
Roys, H. M	.Farwell1885
	. Detroit, 410 Gr'd River Ave. 1884
	.Dowagiac1886
Rudolphi, Louis	.Dowagiac
	.Dowagiac 1883
Rumer, J. F	.Richfield1885
Rundel, J	.Holton1886
Runner, J. W	.Shelby1886
Rushmore, W	.Elk Rapids1883
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Sakin C D	Controville 1999
Sabin, C. E	.Centreville
Sackett, S. M	Flint
	Detroit
	.Menominee
	.Seney
	Hawold, Dakota
Schanner, Joseph	
01 10 10	
Shimmel, G.R	
Shimmel, G. R	
Schleeper, F. A	
Shimmel, G. R	
Schleeper, F. A	
Schleeper, F. A	
Shimmel, G. R. Schleeper, F. A. Schulz, L. S. Schumacher, A. B. Schumacher, D. A. Scoville, G. R. Seed, A. W.	
Shimmel, G. R Schleeper, F. A Schulz, L. S Schumacher, A. B Schumacher, D. A Scoville, G. R Seed, A. W Seibert, G. F.	
Shimmel, G. R Schleeper, F. A Schulz, L. S Schumacher, A. B Schumacher, D. A Scoville, G. R Seed, A. W Seibert, G. F. Seibert, M. L	
Shimmel, G. R Schleeper, F. A Schulz, L. S Schumacher, A. B Schumacher, D. A Scoville, G. R Seed, A. W Seibert, G. F Seibert, M. L Severson, W. A	
Shimmel, G. R Schleeper, F. A Schulz, L. S Schumacher, A. B Schumacher, D. A Scoville, G. R Seed, A. W Seibert, G. F Seibert, M. L Severson, W. A Share, A. L	
Shimmel, G. R Schleeper, F. A Schulz, L. S. Schumacher, A. B. Schumacher, D. A Scoville, G. R. Seed, A. W Seibert, G. F. Seibert, M. L Severson, W. A Share, A. L Shaw, B. C	
Shimmel, G. R Schleeper, F. A Schulz, L. S Schumacher, A. B Schumacher, D. A Scoville, G. R Seed, A. W Seibert, G. F Seibert, M. L Severson, W. A Share, A. L Shaw, B. C Shaw, S. B	
Shimmel, G. R Schleeper, F. A Schulz, L. S. Schumacher, A. B. Schumacher, D. A Scoville, G. R. Seed, A. W. Seibert, G. F. Seibert, M. L Severson, W. A. Share, A. L Shaw, B. C. Shaw, S. B. Sheffield, W. E	
Shimmel, G. R Schleeper, F. A Schulz, L. S. Schumacher, A. B. Schumacher, D. A Scoville, G. R. Seed, A. W Seibert, G. F. Seibert, M. L Severson, W. A Share, A. L Shaw, B. C Shaw, S. B Sheffield, W. E Sherling, F. W	
Shimmel, G. R Schleeper, F. A Schulz, L. S. Schumacher, A. B. Schumacher, D. A Scoville, G. R. Seed, A. W Seibert, G. F. Seibert, M. L Severson, W. A Share, A. L Shaw, B. C Shaw, S. B Sheffield, W. E Sherling, F. W Sherlock, T. J	

Sherwood, C. L	.Dowagiac 1884
Shook, D. L	.Coral1884
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3. ÁBRUS. [Greek, "Elegant"].

Nat. Ord. Leguminosæ.

A. precatorius, L.—Hab. Tropical Asia, Africa and America.
 —Indian Liquorice; Liquorice bush, Jamaica wild Liquorice; Liane & Reglisse, Fr.; Indisches Stissholz, Ger.; Phaseolus glycyrrhites, Lat. (A. D. 1700.)

The seeds; JEQUIRITY; Jumble beads, prayer beads, crab's eyes, Love peas or beans, Red beans, Black-eyed Susan; Pois d' Amerique, Fr.; Paternoster Erbsen, Giftbohne, Ger.

Root, a poor substitute for liquorice; SEEDs, (used in Burmah and formerly in India, as weights; also to poison cattle); specific irritant to eye. In chronic granular ophthalmia.

- 4. ACONÍTUM. [From Acona, a town of Bythinia.] Ranunculacese.

 Syn. Aconite, Eng.; Aconit, Fr.; Sturmhut, Ger.
- 1. A. Anthora, L. (A. DeCandollii, eulophum and Jaquini, Reickenback.)—Hab. Europe.—Yellow Helmet Flower; Wholesome Wolfsbane; Salutaire, Fr.; Heilgift, Heilwurz, Ger.; Anthora, Antithora, Lat. Root, bitter, tonic, cathartic, anthelmin*... Dose, 10 to 20 grs.

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